

2009 Quickie Rhythm Service Manual Supplement



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Introduction

Please read and follow instructions in this service manual before attempting to troubleshoot or repair this product for the first time .If there is anything in this Service Manual that is not clear, or if you require additional Technical assistance, contact Sunrise Medical at: (800) 333-4000 option 2, then option 1.

Safely troubleshooting and/or repair of this product depends on your diligence in following the instructions within this manual. Sunrise Medical is not responsible for injuries or damage resulting from a person's failure to exercise good judgement and/or common sense.



There are warning symbols used in this document to focus attention on any hazard that could effect the safety of the individual troubleshooting the chairs covered in this Service Manual.



This Service Manual is intended as a troubleshooting guide for the Quickie Rhythm. Photographs and content may differ from the actual products in some cases due to changes in specifications and other factors.

This Service Manual is intended for use by persons with a basic working knowledge and the skills required in servicing and maintaining Power Wheelchairs. Persons without a General Working knowledge and expertise in the servicing of this product should not carry out troubleshooting procedures. This can result in problems with future servicing, and/or damage to the unit.

Parts and configuration or specifications of Products included in this Service Manual are subject to change without prior notice.

**For up to date parts and the latest version of this manual go to:
www.sunmed.com
and click on the Parts Search button**



Click !

Basic Setup

When setting up the components of the chair, complete the following checklist to ensure proper and safe operation of the equipment.

Check :

- ☐ Are the batteries fully charged?
 - a. Test battery voltage with D.C. meter across the terminals of batteries. The measurement should be above 12 volts D.C.
 - b. If not, fully charge the batteries.
- ☐ Are all necessary power components installed and connected ?
 - a. Input device (normally Joystick)
 - b. Cable from Joystick to the Bus Line
 - c. Control Module; for the Rhythm located at back of chair behind shroud
- ☐ Are all necessary connections fastened or inserted?
 - a. Battery connectors to the batteries
 - b. Cable between Joystick and the Control
 - c. Both Motor Connectors to the Control Module.
- ☐ Is the Drive Gear engaged?
 - a. With the power off the chair should not move if pushed from behind.
 - b. If the chair moves when pushed, refer to proper operation of Drive Gear Engagement section.
- ☐ Does Display light up when Power On/Off switch is depressed?
 - a. If no - recheck the 4 checks listed above then refer to the section on Diagnostics.
 - b. If yes – the Power Wheelchair is ready to drive

Multimeter Tutorial

The Multimeter

The multimeter is one of the most useful tools in the toolbox. It can be used to check wires, shorts, voltages, resistance, all manner of electrical circuits. This tutorial is designed to help clarify the symbols and socket options

MULTIMETER



The Probes

found on various multimeters.

Probes connect the meter to the circuit. Simply touch them to the connections you want to measure and read the display. Obviously, this depends on how the meter is set up, and what is being measured.

PROBES



The Ports

1. The Common Port.

Generally, the black probe plugs in here (negative) and as the name suggests, it's the common element to all of the testing circuits. Think of it as the ground rail.

2. Voltage, Resistance and Continuity port.

This is commonly used option. Connect the red (positive) probe to this port when using any voltage readings, resistance readings or when checking wire continuity (explained in more detail later in the tutorial).

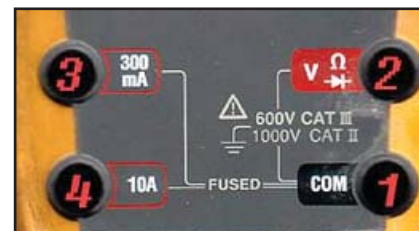
3. Current up to 300mA.

This port is used for "counting electrons" in a circuit, and thus their rate of flow (current being the flow of electrons). You'll notice that this side is "fused", so that you don't end up melting the meter's circuits.

4. Current up to 10A.

Same as above, except it can take more current, as the name suggests.

PORTS



Symbols

This section describes the basic symbols used in a typical multimeter.

AC

This symbol means alternating current. Use this when you want to test something that has AC current running through it. Typically you'd want to test the voltage of an inverter (for cold cathodes or neons) or a similar device.

DC

This means Direct Current. This is the type of electrical power produced by a battery. With a battery connector, the black wire(s) should be connected to the negative(-) terminal of the battery and should be considered the common ground. The red wire(s) should be connected to the positive(+) terminal of the battery and is considered the "hot" lead.

Voltage

This means Voltage or Potential Difference. This measures the potential difference between the two probes. To measure voltage, connect the positive probe to a port that is marked "V" or Voltage.

Note: "mV" means milli-volts .001 Voltage

Current

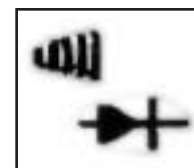
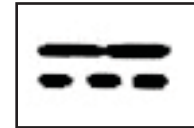
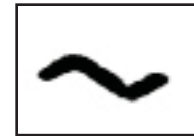
Technically, this term is incorrect. It should be "I" but since current is measured in Amps and the readout value is in amps, the symbol makes sense. This measures the current that is flowing through the part of the circuit between the two probes (the meter itself). Typically, you need to plug the positive terminal into a port marked "A" or Current. You need to put the meter "In Series" in the circuit to use this feature correctly.

Resistance

This symbol means Resistance and is measured in Ohms. You can use this setting to measure the resistance between two points; for example across a piece of wire or a resistor (to check its value). If you don't have a continuity check, then this can be used to check for shorts. Any value below 0.05 Ohms constitutes a short, meaning that whatever the probes are attached to is connected electrically.

Continuity

A commonly used function. Basically, what it does is put a current through the two terminals (the same as the Ohm-meter function) and if the resulting value is within the "contact" range, it will beep. This feature found on some multimeters enables you to check for shorts without taking your eyes off your work. Other meters may have a light that turns on when a short is found.



Good Working Practices

While working on powered mobility products, it is essential to observe good working practices. Below are a series of safety guidelines and recommendations. Please note that these precautions are intended to serve only as a guide, not to supersede or replace any safety statute, NHS or other safety regulations.



General



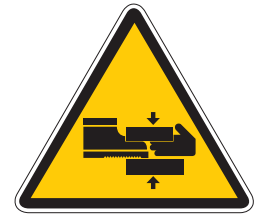
- Always wear suitable protective clothing when handling batteries.
- Always wear suitable eye protection when drilling or inspecting.
- When safe to do so, wear protective gloves when handling the running gear or batteries, as these parts are exposed to paths, parks etc.
- If the drive wheels have to be raised off the floor, always use a pair of axle stands to secure the vehicle.

Battery Safety

- Use extra caution when working with batteries.
- Always make sure that the batteries are disconnected from the vehicle before commencing work.
- Always check that the battery charger is disconnected from the vehicle / batteries before commencing work.
- Do not smoke.
- Keep batteries away from all sources of ignition.
- Do not place objects on the battery tops.
- Always try to keep someone within earshot of your work area so that they may come to your assistance if needed.
- Always wear personal protection when handling batteries, including, eye/face protection and gloves.
- Make sure there is easy access to soap and water in case of acid spills.
- Avoid touching eyes or unprotected parts of the body while working on batteries.
- Remember that non-sealed batteries can contaminate any packaging, housing, or boxes they may have been transported in so handle all packaging with care, especially during disposal.
- If battery acid should come into contact with bare skin or clothing, be sure to wash contacted area immediately, using plenty of soap and water. If battery acid enters the eyes, flush with running cold water for as long as possible while medical help is being sought.
- When the tops of batteries are exposed, take extra care when working on or around the terminals.
- Do not allow metal tools to drop on to or touch the exposed terminals of the batteries or other exposed connections, as this could cause a short circuit, which may result in an explosion.



- Remove personal items of jewelry, such as rings, watches, chains etc. before working on batteries. Such items could cause short circuits resulting in serious burns.
- Batteries are constructed of heavy materials. Therefore moving batteries requires appropriate lifting techniques. Safety footwear should also be worn. In addition, disposal of old batteries requires correct procedures. Contact your local authority for their recommendations.



Battery Chargers

- Remember battery chargers are connected to household current.
- Always observe all guidelines and laws relating to electrical equipment.
- Never operate the battery charger in wet or damp conditions.
- If you think that the charger has been exposed to water or excessive dampness, do not use it. Return the unit to the dealer/supplier for inspection/replacement.
- If you think the battery charger is defective or is visibly damaged, return the unit to the dealer/supplier for inspection.



EMI Warnings

- EMI means electromagnetic (EM) interference (I). EMI comes from radio wave sources, such as radio transmitters and transceivers. A “transceiver” is a device that both sends and receives radio wave signals.)
- There are a number of sources of intense EMI in our daily environment. Some of these are obvious and easy to avoid. Others are not, and we may not be able to avoid them.
- Powered wheelchairs, although tested in accordance with EMC guidelines, may be susceptible to electromagnetic interference (EMI) emitted from sources such as, radio stations, TV stations, amateur radio (HAM) transmitters, two-way radios, and cellular phones.
- EMI can also be produced by conducted sources or electro-static discharge (ESD).



What effect can EMI have?

1. EMI, without warning, can cause a power chair to:
 - Release its electronic brakes
 - Move by itself
 - Move in unintended directions.
 - If any of these occur, severe injury could result.
2. EMI can damage the control system of a power chair, resulting in a safety hazard and/or costly repairs.

Sources of EMI

1. Hand-Held Transceivers: The antenna is usually mounted directly on the unit.

These include:

- Citizens band (CB) radios
- “Walkie-talkies”
- Security, fire and police radios
- Cellular phones
- Lap top computers with phone or fax
- Other personal communication devices



Note - These devices can transmit signals while they are on, even if not in use. The wheelchair should be switched off when not in use.

2. Medium-Range Mobile Transceivers: These include two-way radios used in police cars, fire engines, ambulances and taxi cabs. The antenna is usually mounted on the outside of the vehicle.

3. Long-Range Transceivers: These include commercial radio and TV broadcast antenna towers, amateur (HAM) radios and alarm systems in department stores.



NOTE- The following are Not likely to cause EMI problems: Lap-top computers (without phone or fax), cordless phones, TV sets or AM/FM radios, CD or tape players. EM energy rapidly becomes more intense as you get closer to the source. For this reason, EMI from handheld devices is of special concern. A person using one of these devices can bring high levels of EM energy very close to a power chair without the user's knowledge.

Immunity level

The level of EM is measured in volts per metre (V/m). Every power wheelchair can resist EMI up to a certain level. This is called its “immunity level”. The higher the immunity level, the less the risk of EMI. It is believed that a 20 V/m immunity level will protect the power wheelchair user from the more common sources of radio waves.

The configuration tested and found to be immune to at least 20 V/m is: Rhythm power wheelchair with a right-handed mounted joystick system, 18” seat width, 18” seat depth, dual-post height-adjustable armrests, fixed tapered legrests with one-piece solid footplate and Gp 24 gel cell batteries.

The following dealer installed speciality input devices have an unknown effect on the immunity level because they have not been tested with the Quickie control systems:

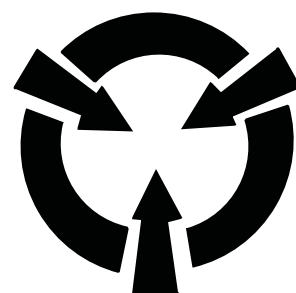
- Breath Control (“Sip n Puff”)
- Tri-Switch Head Array
- Proximity Head Array
- Proportional Mini-Joystick/Chin Control
- Buddy Button
- Wafer Board

Electro Static Discharge

To help prevent Electro Static Discharge (ESD) the following proper handling techniques should be followed:

ESD:

- Do not place Printed Circuit Boards or their containers near sources of strong electrical fields (such as above a CRT).
- To avoid the occurrence of static charge or discharge due to friction, keep the Printed Circuit Boards separate from one another and do not stack them directly on top of one another if not protected by antistatic bags.
- Store each Printed Circuit Board in an antistatic bag with an external cushioning bubble-wrap layer until assembled to wheelchair. Antistatic bag must have metal content to protect the printed circuit board. Gray bag protects from ESD, pink bag or bubble wrap does not protect as well.
- Always wear an ESD preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system (such as a captive installation screw).
- Handle Printed Circuit Boards by the edges only; avoid touching the Printed Circuit Board and connector pins.
- Place any removed Printed Circuit Board on an antistatic surface or in a static shielding bag.
- Avoid contact between the Printed Circuit Boards and clothing. The wrist strap only protects the card from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Make sure that the Printed Circuit Board power is off by disconnecting the seating harness prior to attaching or removing printed circuit board.



Printed Circuit Board Flexing:

- The printed circuit board has surface-mount components that may break when the board is flexed. To minimize the amount of board flexing, observe the following precautions:
- Hold the printed circuit board only by the edges.
- Do not place the printed circuit board on a hard surface.
- Tighten board mounting screws only hand tight (torque 12.4 in lbs/1.4Nm) in a cross pattern to reduce stress on mounting holes and PCB board material.

Batteries

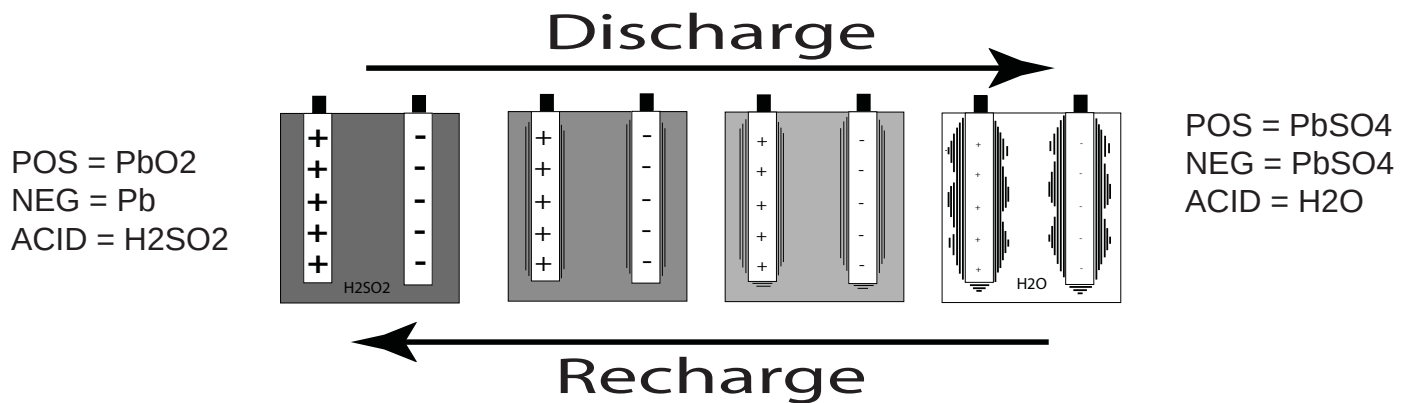
Safety

If mishandled batteries can be dangerous and hazardous.

- All mobility batteries, whether wet type or gel/sealed type, contain lead and sulfuric acid. Both of these materials are toxic and in the case of sulfuric acid, highly corrosive. Additionally, when batteries are charged, they produce hydrogen gas which is “highly” flammable and can cause explosion. This is why proper handling is mandatory at all times.
- Battery explosion - This is frequently the result of too low an acid/electrolyte level in the battery, which allows high concentrations of hydrogen to build up. This is possible with all batteries if improper charging or battery failure occurs, but not common in gel/sealed batteries.
- < KEEP SPARKS AND FLAMES AWAY FROM BATTERIES >
- Burns - dropping a wrench or screwdriver across battery terminals results in sparks, and intense heat. Improper assembly of battery boxes or battery box wiring may short the battery through the wiring and produce a possible electrical fire.
- Electronic damage - batteries that are improperly wired can short out electronic chair components resulting in expensive repairs.
- Pollution - improper disposal of batteries could damage the environment. All batteries should be disposed of through a reliable battery recycler.



Battery Charge Cycle Illustration
Typical Flooded Battery



As battery discharges, the sulfate from the electrolyte forms on the plates.
As battery recharges, the sulfate is driven back into the electrolyte

Battery Diagnostics

Batteries should last an average of 1 to 1.5 years.

Factors that affect battery performance:

- Maintenance - Poor maintenance.
- Charging - Improper charging shortens battery life.
- Chair Components - Malfunctioning electronics, bad motors, electric brakes, and corroded wiring are just some of the factors that may affect battery life and performance.

Battery Servicing and Replacement

Automobile batteries, which are used for starting, are tested with a load tester to assure a high rate of energy production in a short burst.



The voltmeters on load testers are not accurate enough to establish a state of charge.

Deep-cycle batteries produce energy more slowly and are designed to hold up to constant discharging and recharging. Testing a deep-cycle wheelchair or scooter battery requires different procedures than an automobile battery.

A routine for testing deep-cycle batteries should follow these guidelines:

Never replace just one battery at a time. This will create an imbalance when charging and ultimately damage both batteries.

Check batteries for a voltage difference. A voltage difference of more than .4 volts D.C. is a true indicator of a bad battery.

Voltage test - A dead battery cannot be effectively tested, yet many people mistakenly try to do just that.

Any battery that reads 11.0 volts or less is technically dead.

To perform any testing, especially a load test:

A. Batteries must be charged

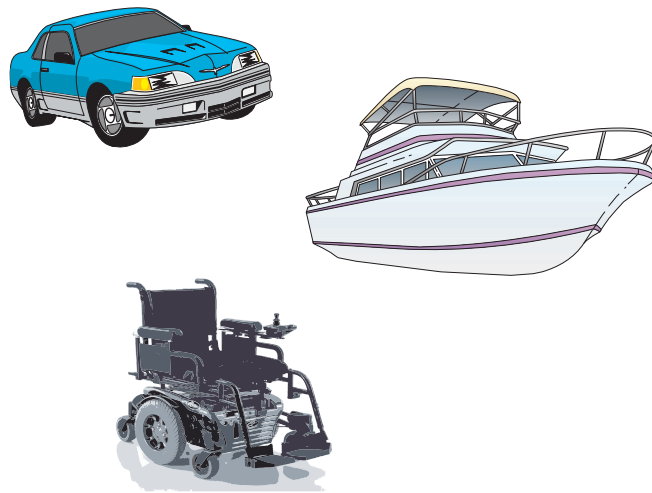
B. The top charge must be taken from fully charged batteries if charge rate has just finished.

- *Load Test* - This test can only be done on fully charged batteries and can diagnose one type of problem, an internal short.
- *Capacity/ Discharge Test* - This is the only accurate way to test a deep-cycle battery for adequate running time. The problem with this test is that it is time consuming.
- *Current / Voltage check with a regular interval check* - Another way of truly knowing how much time your battery will last is also time consuming.

Battery Types

REMEMBER: IT IS THE RESPONSIBILITY OF THE INSTALLER TO KNOW WHAT KIND OF BATTERIES TO INSTALL IN THE CUSTOMER'S WHEELCHAIR!

- Deep-cycle batteries are designed to be discharged and recharged on a regular basis.
- Starting or automotive type batteries use a rapid burst of power to start an engine and are quickly recharged by an alternator or generator. They are rated by cold cranking amps, a measure that has no relevance to wheelchair application.
- Marine and RV batteries frequently are not deep-cycle as they are often used for starting engines.
- **Only use Deep-Cycle sealed type batteries in a wheelchair.**



22 NF



Battery Size

- Batteries function as a power wheelchair's fuel tank. The larger the group size, the farther the wheelchair will go.
- Use the size specified by the wheelchair manufacturer. Never use undersized batteries.

VR2 Remote Controller



VR2 Controller Buttons

Battery Gauge

A series of ten LED's, which indicate charge level.



On/Off Key- Press to power on or off the power chair or Controller.

Horn Key- Activates a warning horn.



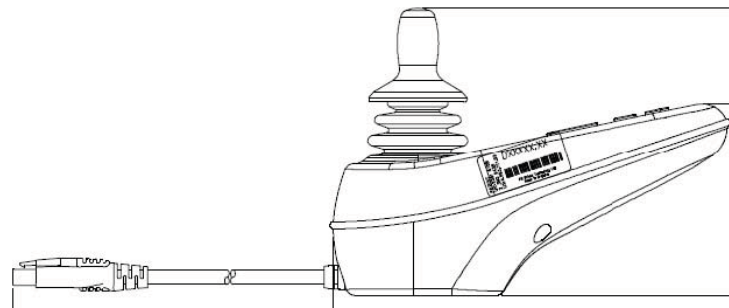
Speed/ Profile Decrease. Used to decrease the Speed/ Profile setting.



Speed/Profile indicator- A series of five LED's, which display speed and profile settings

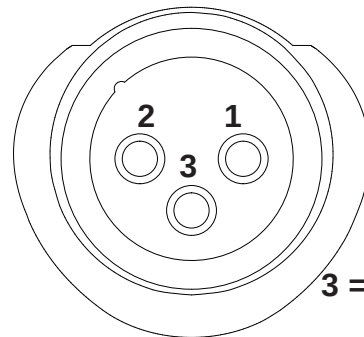
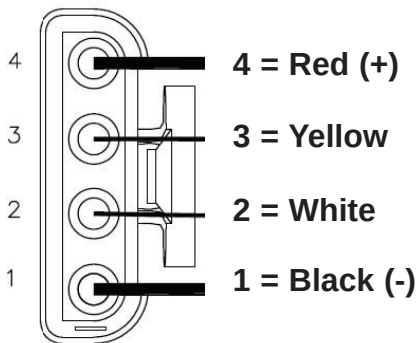
Speed/ Profile Increase. Used to Increase the Speed/ Profile setting.

VR2 Plugs/Connectors



4pin

charger port



1 = 24 Vdc

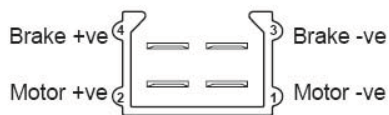
2 = 0 Vdc

3 = Inhibit 1/ Programmer

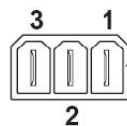
Charger port
Outside View

Motor Plug Port

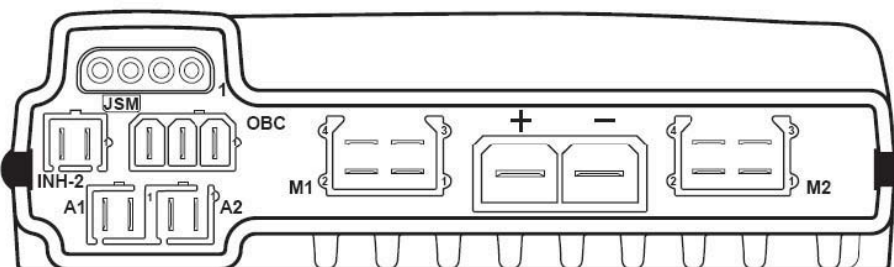
MOTOR 1



On-Board Charger (not used)



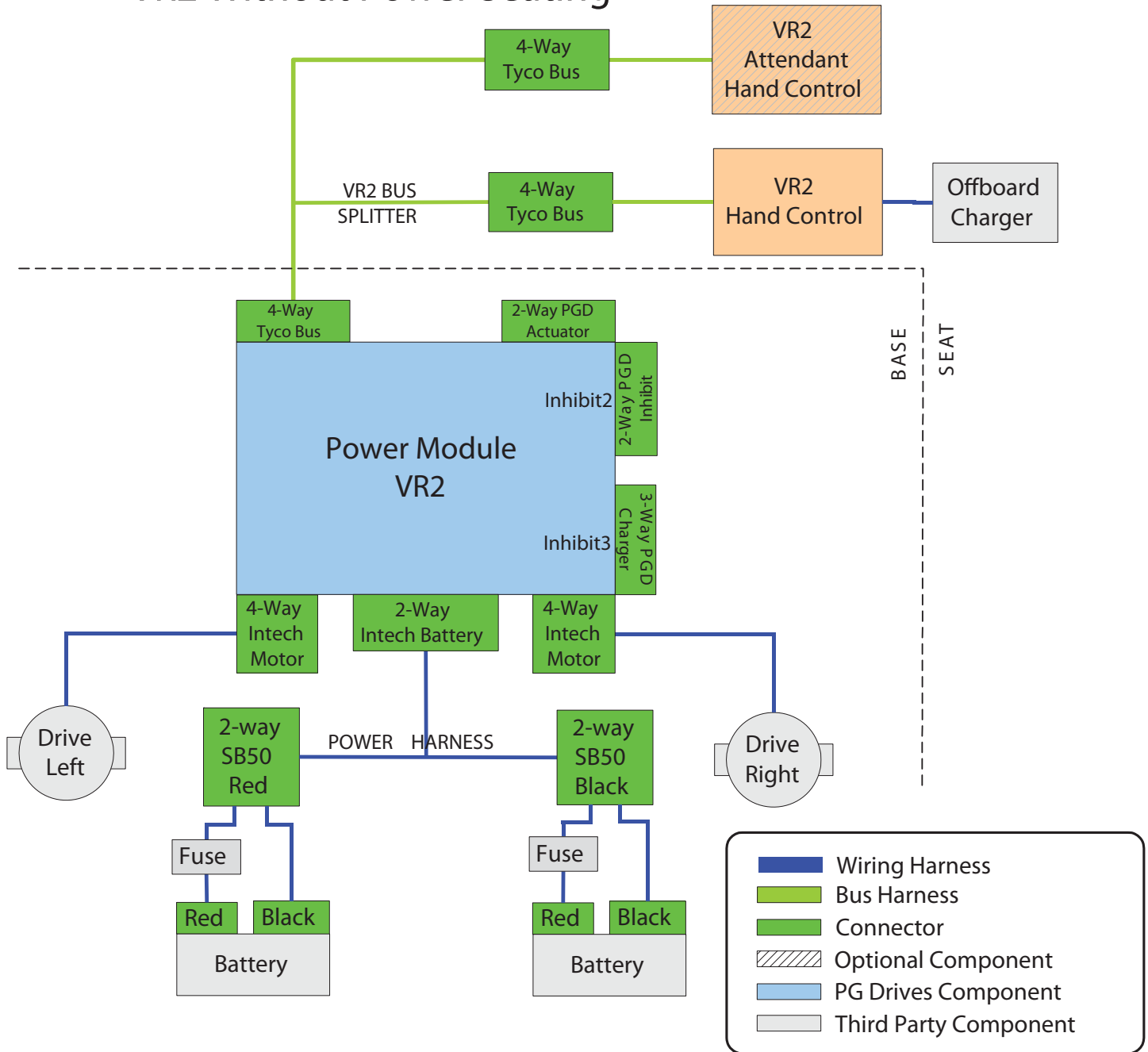
VR2 Controller



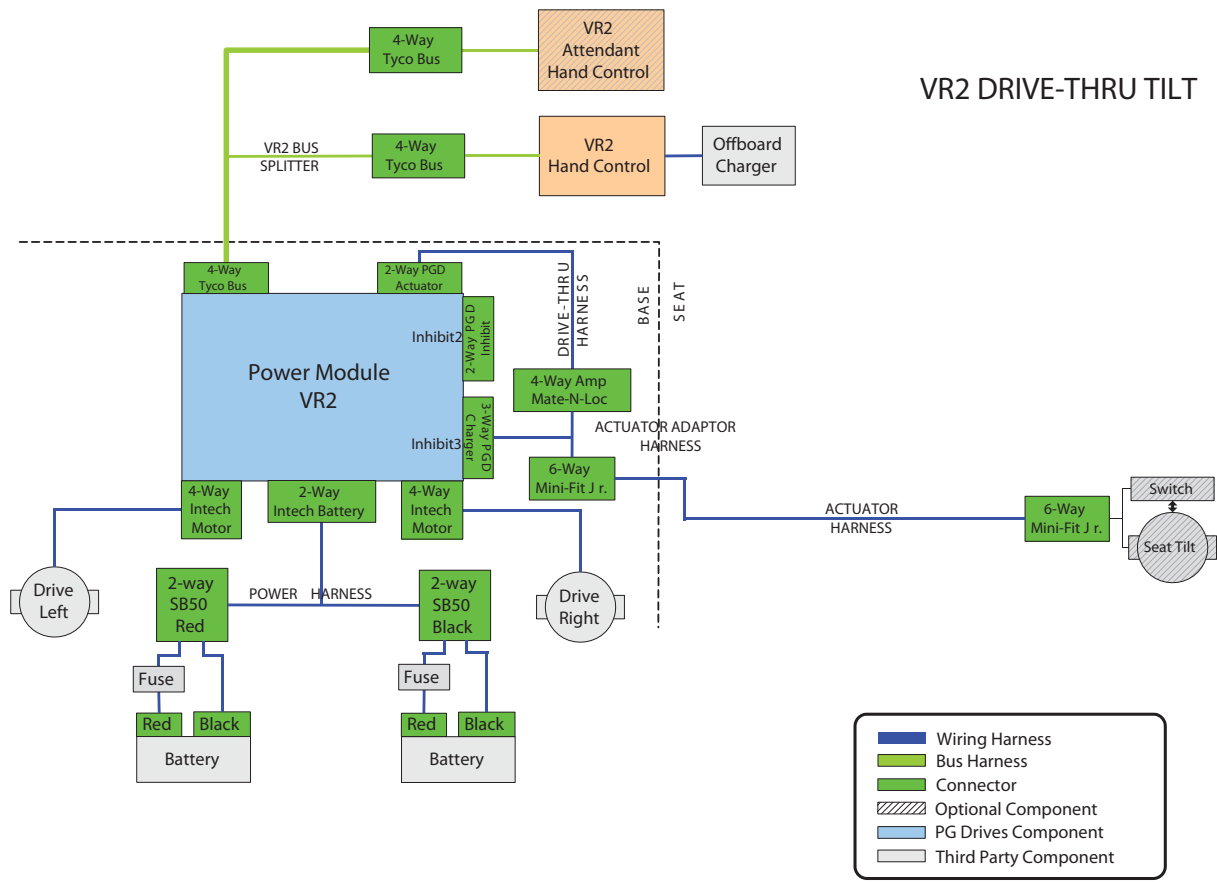
M1 = RIGHT SIDE MOTOR
M2 = LEFT SIDE MOTOR
JSM = JOYSTICK MODULE
INH-2 = INHIBIT 2
A1 = ACTUATOR 1
A2 = ACTUATOR 2
OBC = ON BOARD
CHARGER (not used)
+ - = BATTERY

VR2 -Main Wiring Diagrams

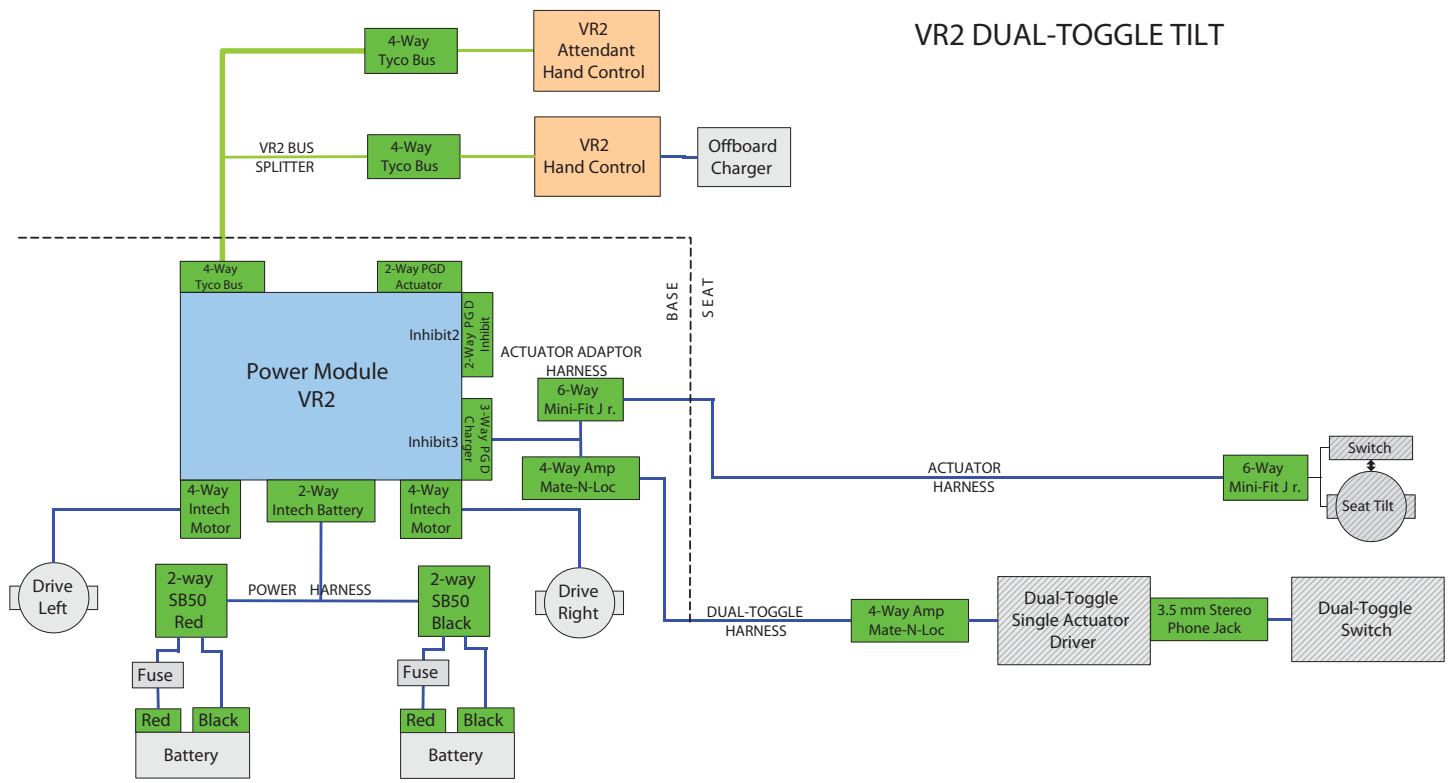
VR2 Without Power Seating



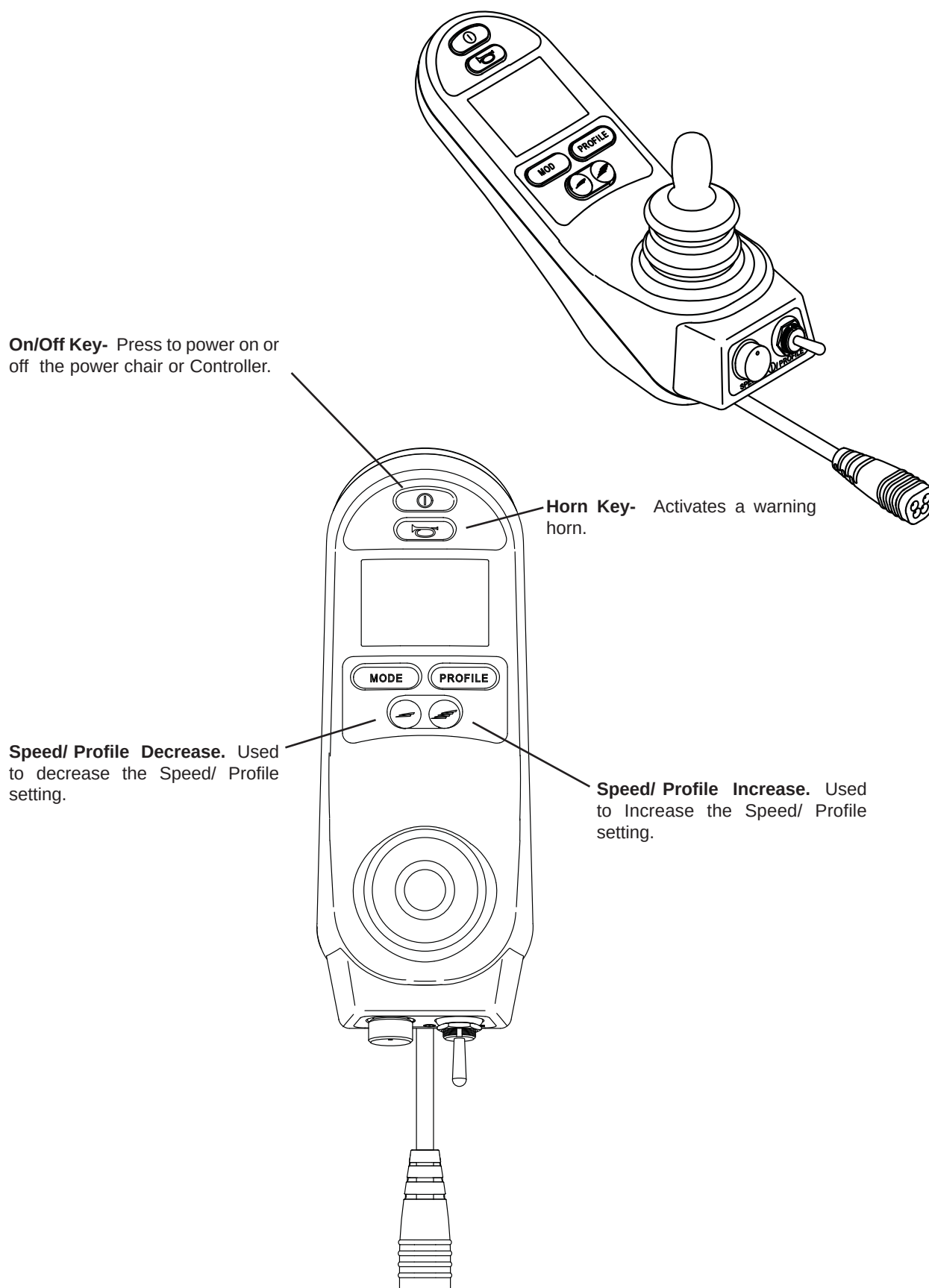
VR2 DRIVE-THRU TILT



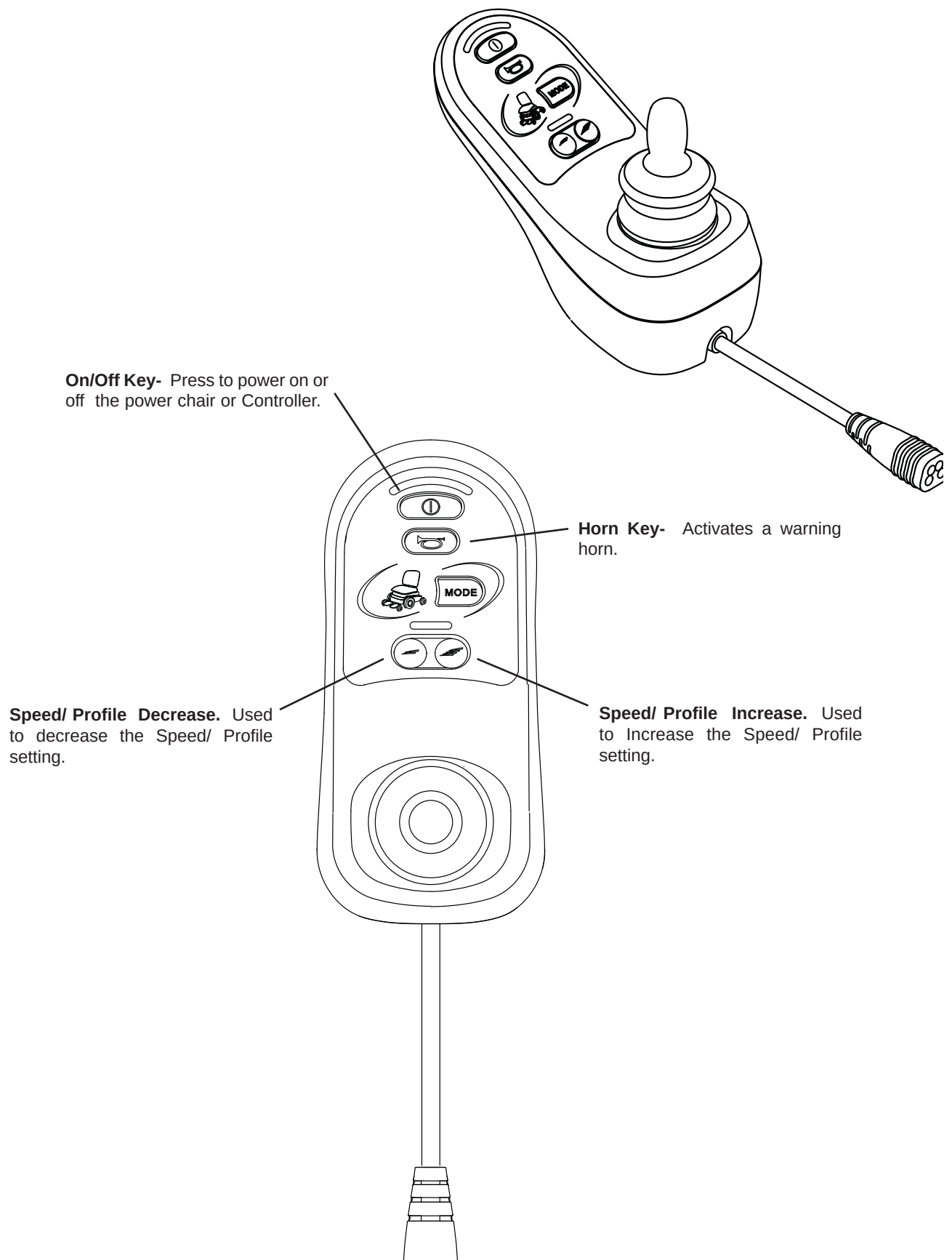
VR2 DUAL-TOGGLE TILT



R-NET Remote Controller

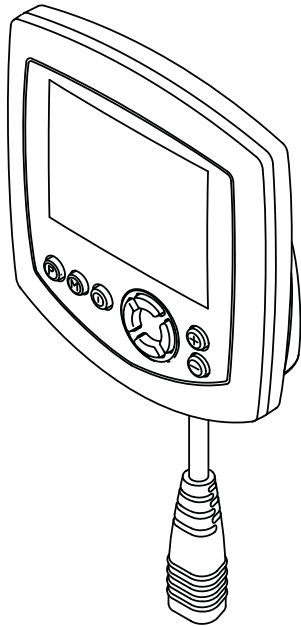


R-NET Remote Controller

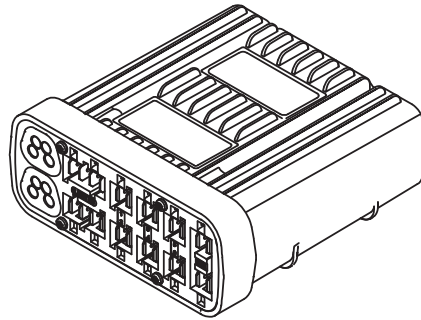


R-NET Optional Electronics

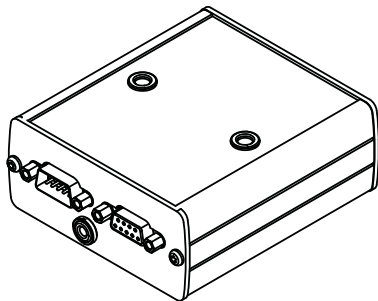
R-net Omni



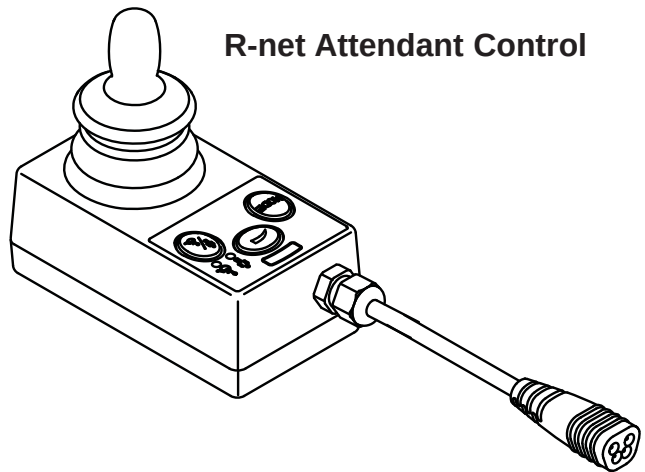
R-net ISM (Intelligent Seating Module)



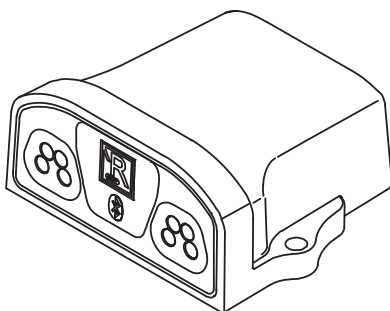
R-net Output Module



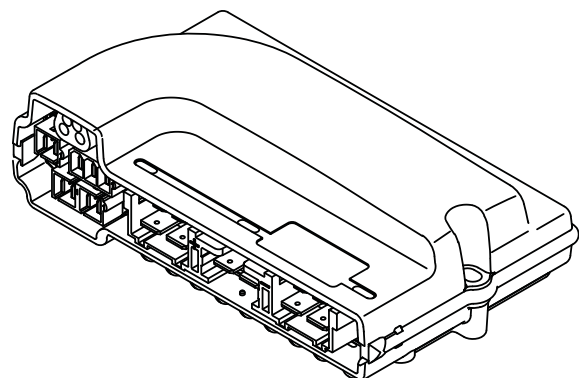
R-net Attendant Control



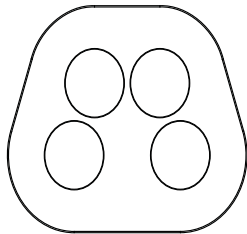
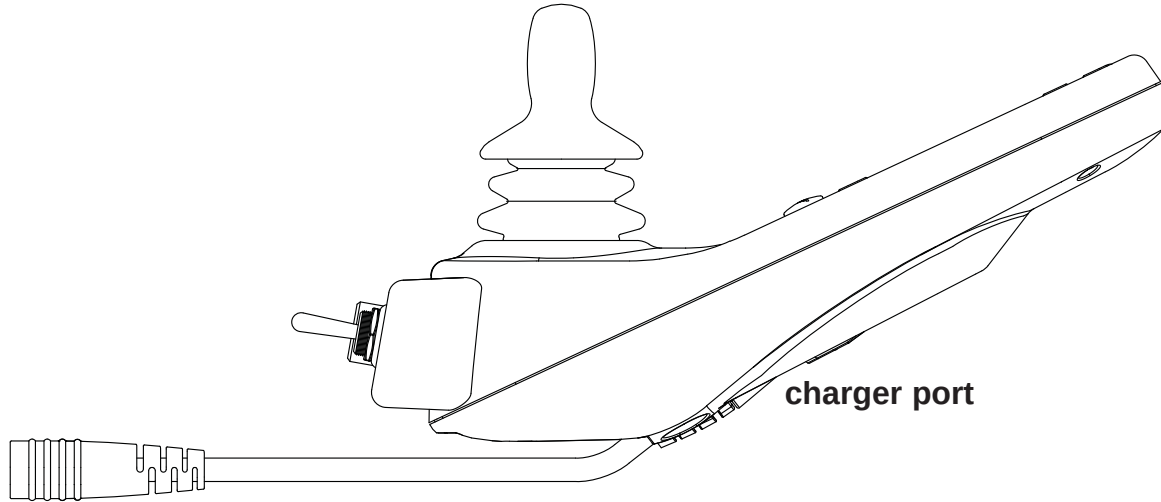
R-net Blue Tooth Module



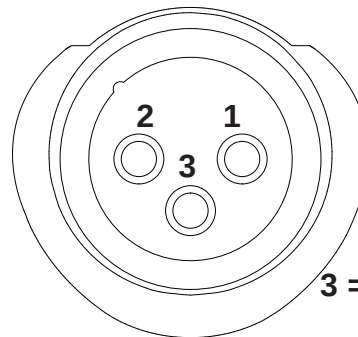
R-net Power Module



R-NET Plugs/Connectors



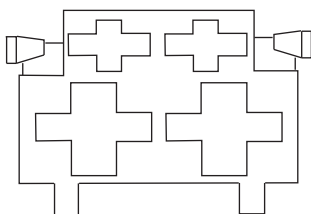
- 4 = Red (+)
- 3 = Yellow
- 2 = White
- 1 = Black (-)



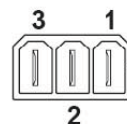
- 1 = 24 Vdc
- 2 = 0 Vdc
- 3 = Inhibit 1/ Programmer

Charger port
Outside View

Motor Plug Port

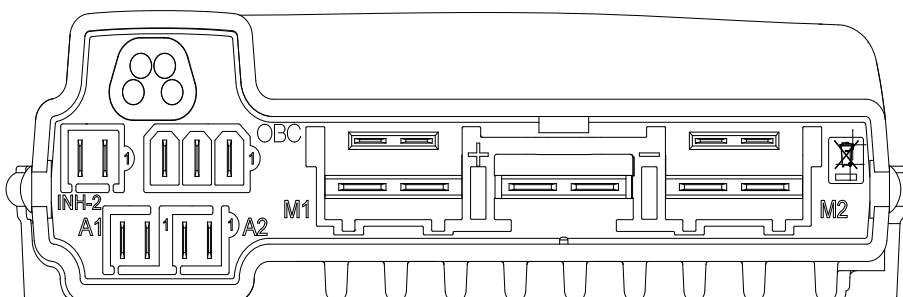


On-Board Charger (not used)



- 1 = 24 Vdc
- 2 = 0 Vdc
- 3 = INHIBIT 1/
PROGRAMMER

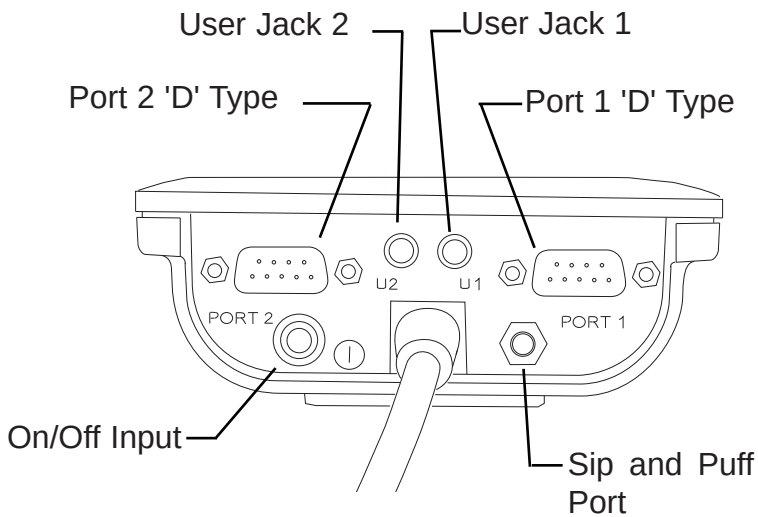
R-net Controller



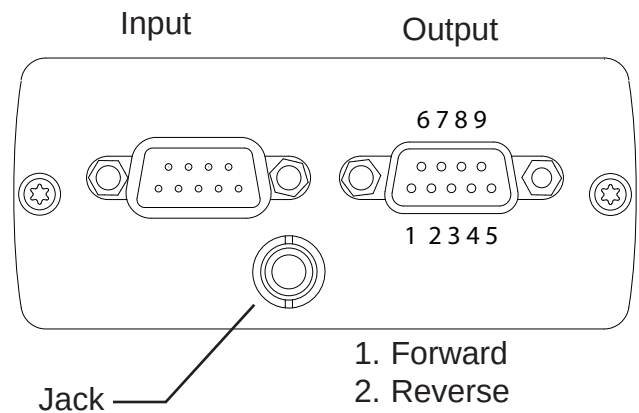
- M1 = RIGHT SIDE MOTOR
- M2 = LEFT SIDE MOTOR
- JSM = JOYSTICK MODULE
- INH-2 = INHIBIT 2
- A1 = ACTUATOR 1
- A2 = ACTUATOR 2
- OBC = ON BOARD
CHARGER
- + - = BATTERY

R-NET Plugs/Connectors

Omni (bottom)

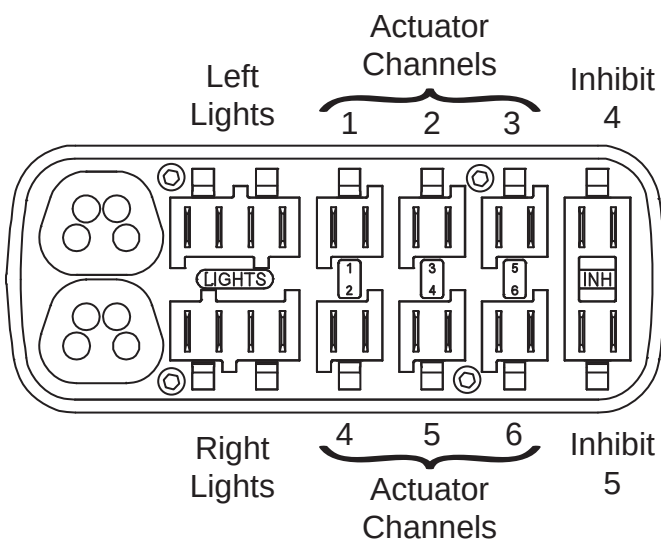


Output Module



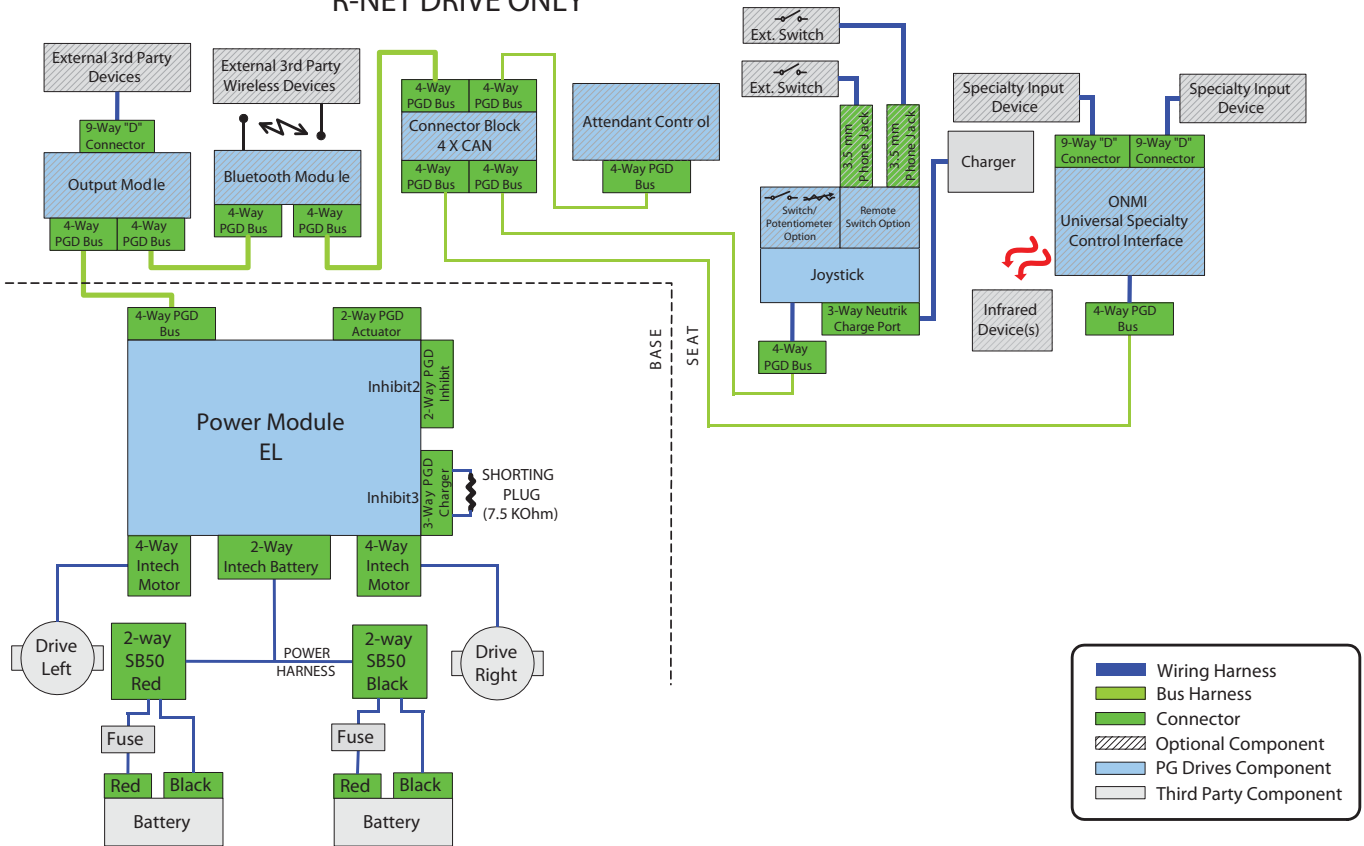
1. Forward
2. Reverse
3. Left
4. Right
5. Speed Down
6. Speed UP
7. Horn
8. Common
9. NC

ISM (Intelligent Seating Module)

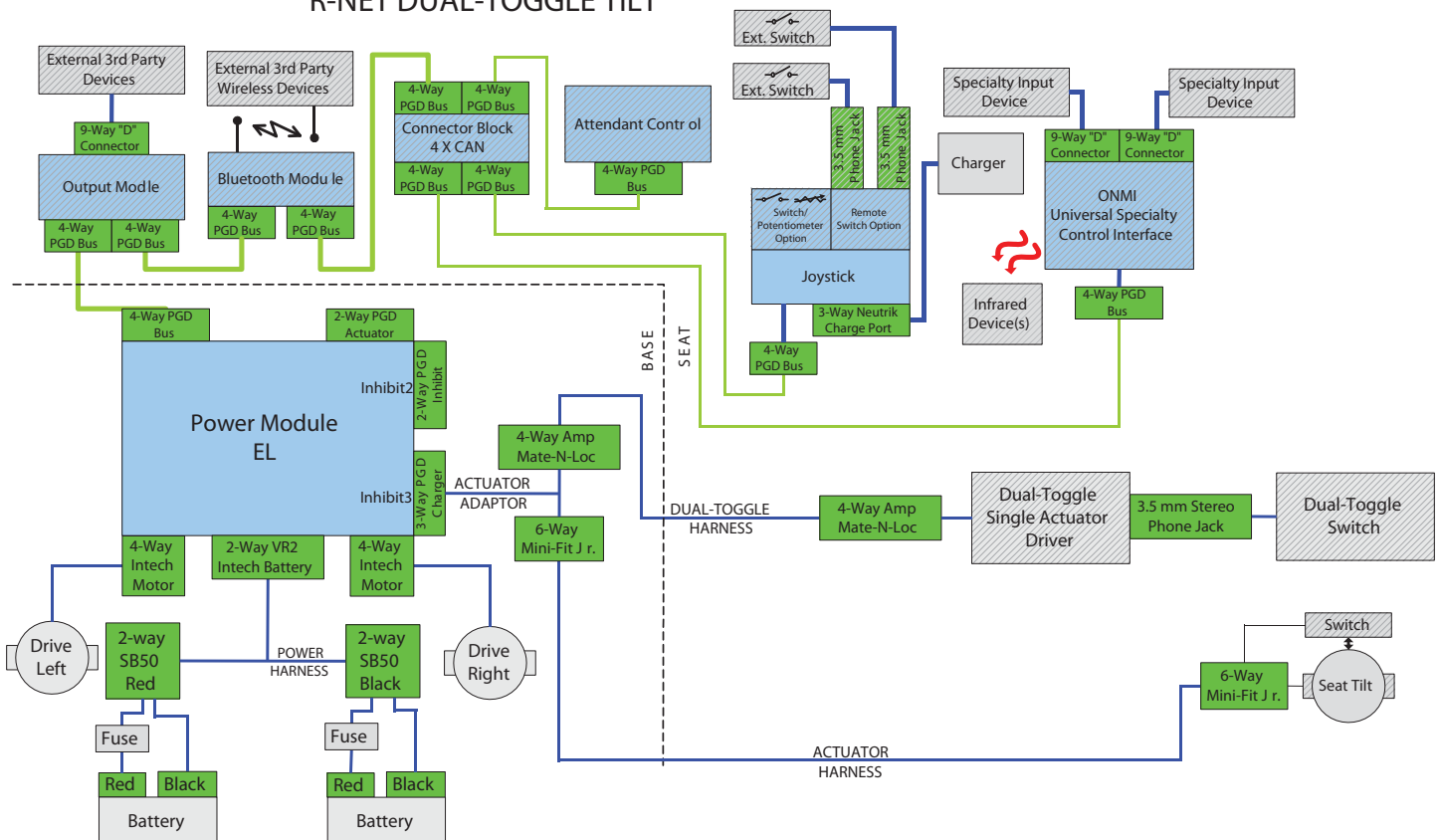


Main Wiring Diagram R-NET

R-NET DRIVE ONLY

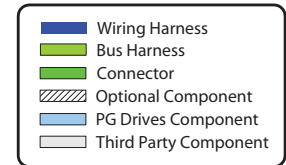
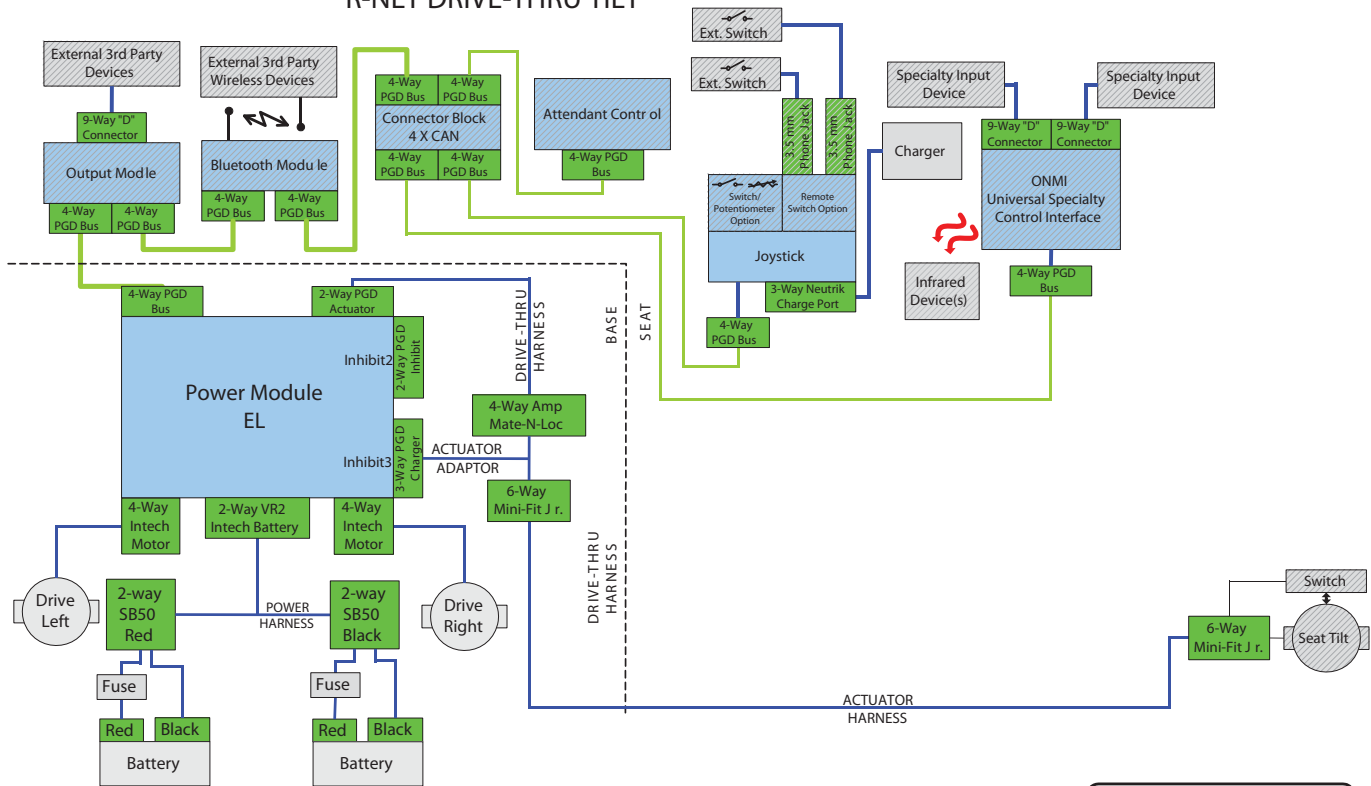


R-NET DUAL-TOGGLE TILT

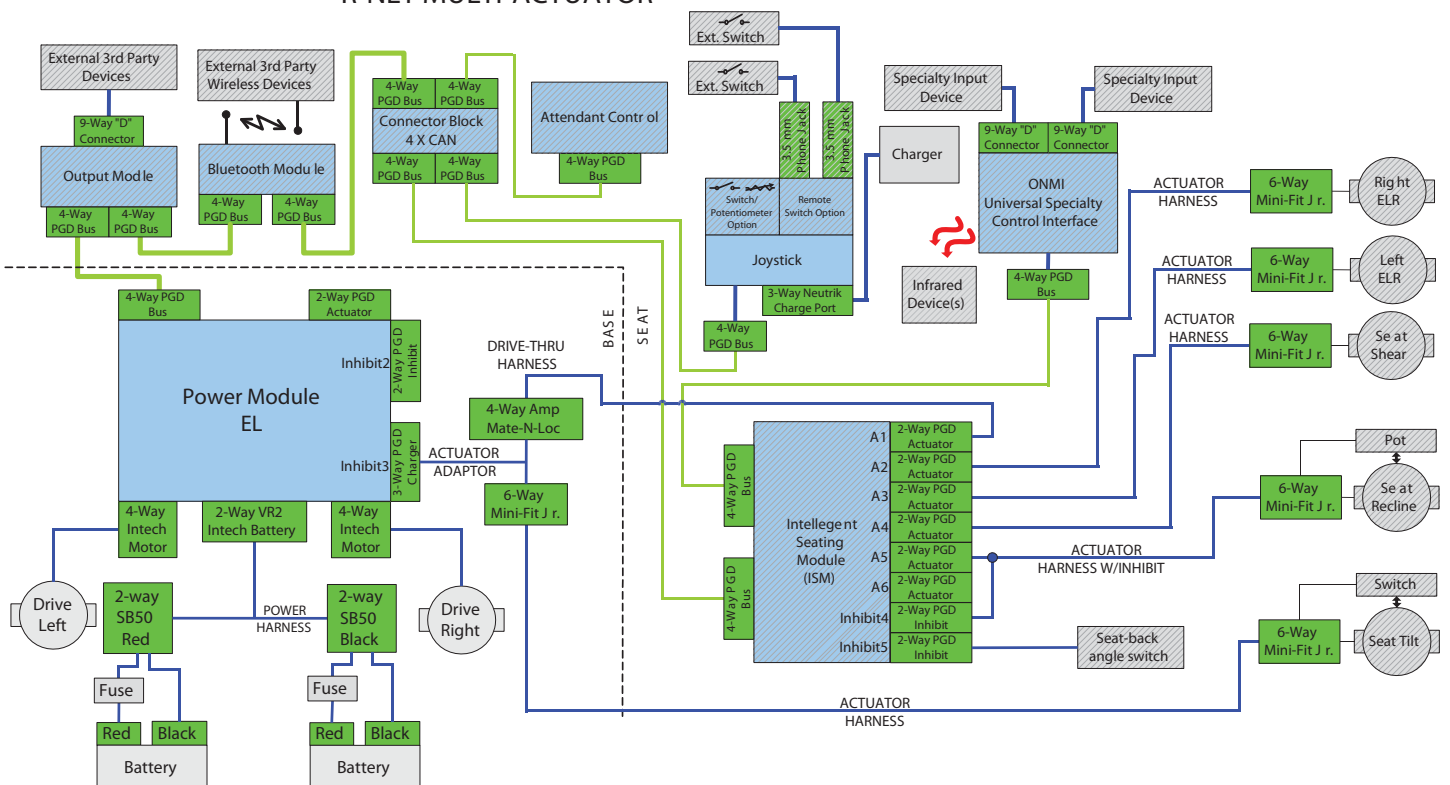


Main Wiring Diagram R-net

R-NET DRIVE-THRU TILT



R-NET MULTI-ACTUATOR

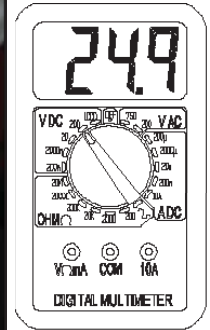


Section 1

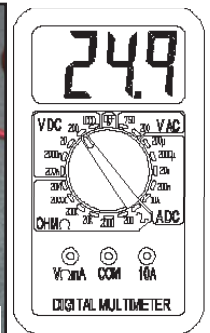
Troubleshooting: No Power (cont.)

Battery Connection Test

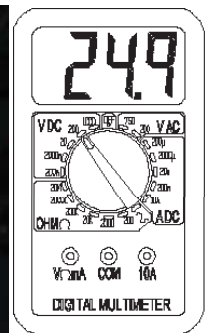
1. Check that the female VR2 Bus plug on the chair has voltage. Set the meter to DC volts and measure pins 4 (using the red lead of the meter) and 1 (using the black lead of the meter) as shown in (fig A1.1.1)
If the voltage meter reads full voltage, then replace the joystick module



2. If the voltage meter reads zero voltage measure the corresponding pins on the VR2 controller as shown in (figure 1.1.2).
If the voltage reads full voltage at the motor controller, then replace the remote cable.



3. If the voltage meter reads zero at the motor controller, then measure the battery harness connector as shown in (figure 1.1.3). If the voltage meter reads full voltage at the battery harness, then replace the Motor Controller.

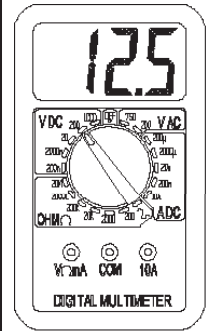
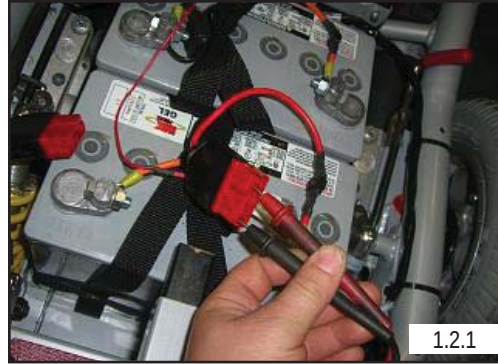


Section 1

Troubleshooting: No Power (cont.)

Check Battery Wire Harness

Check that the battery wire harness has the polarity correct. Set the meter to dc volts and measure the connector with the red lead on the + terminal and the black lead on the negative terminal as shown in (figure 1.2.1). If the polarity is reversed correct battery wiring.



Section 2

VR2 Remote Controller Display

The Maximum Speed Indicator Ripples

Indicates that the wheelchair is locked. To unlock the wheelchair, deflect the joystick forwards until the control system chirps. Then deflect the joystick in reverse until the control system chirps. Release the joystick, there will be a long beep. The wheelchair is now unlocked.

To lock the wheelchair, while the control system is switched on, depress and hold the on/off button. After 1 second, the control system will chirp. Now release the on/off button, deflect the joystick forwards until the control system chirps, and deflect the joystick in reverse until the control system chirps. Release the joystick, there will be a long beep. The wheelchair is now locked.

The Maximum Speed Indicator Flashes

This indicates that the chair is charging. The chair will be ready to drive as soon as the charger is unplugged from the chair and power is recycled.

Battery Gauge is Steady

This indicates that all is well.

Battery Gauge Flashes Slowly

The control system is functioning correctly, but you should charge the battery as soon as possible. At 22 V, the red light starts to blink. Each bar represents a .5V value. The controller requires 18V to start and a minimum of 16V to work once started.

Battery Gauge Steps Up.

Indicates the wheelchair batteries are being charged with the offboard charger. You will not be able to drive the wheelchair until the charger is disconnected and you have reset the control system by switching off the power and then powering up again.

Battery Gauge Blinks Once Every 2.5 Seconds

The control system has "gone to sleep" because the wheelchair has not been driven for a period of time. The time period depends on the programming of the system. To re-start, reset the system by switching off the power and then powering up again.

Battery Gauge Flashes Rapidly

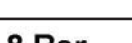
Make sure the Joystick is completely released (Joystick should be centered and/or nothing is pushing the gimbal out of center). The control system safety circuits have been activated and the control system has been prevented from moving the wheelchair. This indicates a system trip, i.e. the VR2 has detected a problem somewhere in the wheelchair's electrical system. Please refer to Section 3 (VR2 Controller Diagnostics).

Section 2

VR 2 Remote & R-Net LED Controller Display

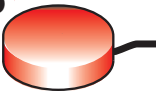
Note: On hand controls that contain LED battery gauges, they will display the fault code by illuminating various LED's. Refer to the Corrective Action column for a list of items to check for each fault.

Table 1, Error Codes cont.

Bar Indication	Corrective Action
1 Bar 	The battery needs charging or there is a bad connection to the battery. Check the connections to the battery. If the connections are good, recharge the battery.
2 Bar 	Verify that the left motor is connected to the control module. Complete the Motor and Gearbox Inspection section of this manual.
3 Bar 	The left motor has a short circuit to a battery connection. Contact Sunrise Medical Technical Service for assistance.
4 Bar 	The right motor has a bad connection. Complete the Motor and Gearbox Inspection section of this manual.
5 Bar 	The right motor has a short circuit to a battery connection. Contact Sunrise Medical Technical Service for assistance.
6 Bar 	The wheelchair is being prevented from driving by an external signal. Verify that the battery charger is not connected. Contact Sunrise Medical Technical Service for assistance.
7 Bar 	Ensure that the joystick is centered upon power up. If it is centered, replace the hand control, and or cable.
8 Bar 	A control system fault is indicated. Make sure that all connections are secure. Contact Sunrise Medical Technical Service for assistance.
9 Bar 	The parking brakes have a bad connection. Complete the Motor and Gearbox Inspection section of this manual.
10 Bar 	Verify that the battery charger is not defective. Leave the chair on for a few minutes to drain off the excess charge. Check the condition of the battery charger.
7 Bar + S 	A communication fault is indicated. Make sure that joystick cable is securely connected and not damaged.
Actuator Flash 	An Actuator trip is indicated. If more than one actuator is fitted, check which actuator is working correctly. Check the actuator wiring.

Section 2

R-Net Color Joystick & OMNI Controller Display Symbols

 Restart	When the control system requires a reboot this system will be flashing. Recycle power
 Motor Temperature	This symbol is displayed when the control system has intentionally reduced power to the motors in order to protect them against heat damage. (thermal rollback)
 Control System Temperature	This symbol is displayed when the control system has intentionally reduced its own power in order to protect itself against heat damage.
 Timer	This symbol is displayed when the control system is changing between different states. An example of this would be entering into programming mode. This symbol is animated to show the sands falling.
E-Stop  E-Stop	If the control system is programmed for latch drive or actuator operation, then it is normal for an emergency stop switch to be connected into the external profile switch jack (user switch). If the emergency stop switch is operated or disconnected, this symbol will flash.
 Environmental	This icon will appear when the environmental mode is entered.
 BlueTooth	This icon will appear when Bluetooth mode is entered.
 In Focus	When the control system contains more than one method of direct control, such as a secondary joystick module or a dual attendant module, then the module that has control of the wheelchair will display the Focus symbol.
 Speed Limit	If the speed is being limited, for example by a raised seat, then this symbol will be displayed.
 Latched	When the control system is operated in a latched condition this symbol will be displayed.
 Sleep	This symbol is displayed when the R-net has gone into sleep mode.
 Control System Locked	The control system can be locked in one of two ways. 1. using a physical key 2. using a key sequence How the control system is locked depends on how the chair is programmed.

Section 2

Section 3

VR2 Controller Diagnostic Codes

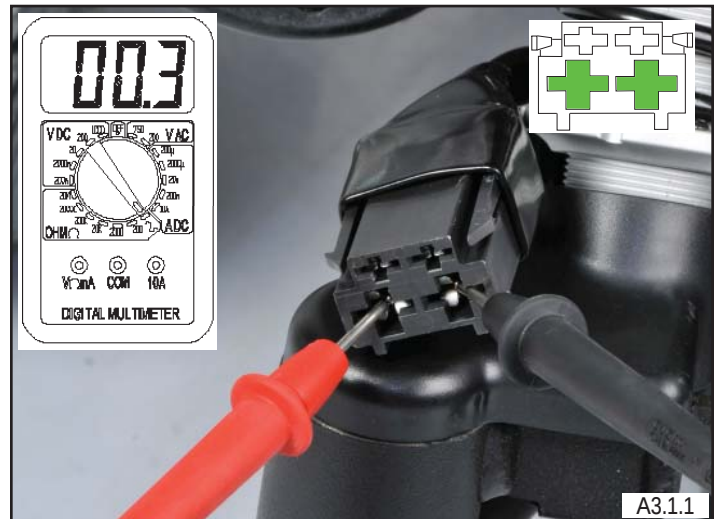
One Bar - Low Battery Voltage)

This code could indicate discharged batteries, failed batteries, or poor battery connections. Begin by recharging the batteries and then refer to Section 1 to check batteries and connections.

Two Bars - Left Motor Disconnected

Check that the batteries are fully charged and in good condition; and check all cables and connections. Check the connections to the left motor, look for a loose or damaged connector.

Use the meter to check the resistance across the two bottom contacts (thicker wires) on the 4-pin motor connector as shown in (figure 3.1.1). If the meter reads between 0 to 1.5 ohms, then replace the controller. If none of the above corrects the problem, replace the left motor.



Otherwise, check the brushes on the left motor (Figure A3.1.2). Ensure that they are not excessively worn. Replace as required.



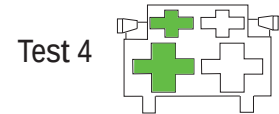
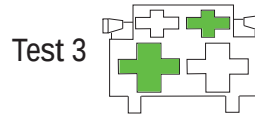
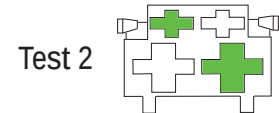
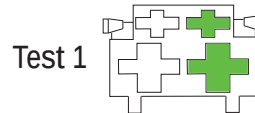
Section 3

VR2 Controller Diagnostics Codes (cont.)

Three Bars - Left Motor Wiring Trip)

Check that the batteries are fully charged and in good condition; and check all cables and connections. Check the connections to the left motor, look for a loose or damaged connector.

Measure the resistance from the bottom contact of the red thick wire on the 4-pin left motor connector to each of the top contacts of the connector (figure 3.2.1). Measure the resistance from the bottom contact of the black thick wire on the 4-pin left motor connector to each of the top contacts of the connector see (below right). If all of the readings are open, then replace the controller. If any of the readings are short, then replace the left motor.



Section 3

VR2 Controller Diagnostics Codes (cont.)

Four Bars- Right Motor Disconnected

Check that the batteries are fully charged and in good condition; and check all cables and connections. Check the connections to the right motor, look for a loose or damaged connector.

Use the meter to check the resistance across the two bottom contacts of the thicker wires on the 4-pin motor connector as shown in (figure 3.3.1). If the meter reads between 0 to 1.5 ohms, then replace the controller. If none of the above corrects the problem, replace the right motor.



Otherwise, check the brushes on the right motor (Figure 3.3.2). Ensure that they are not excessively worn. Replace as required.



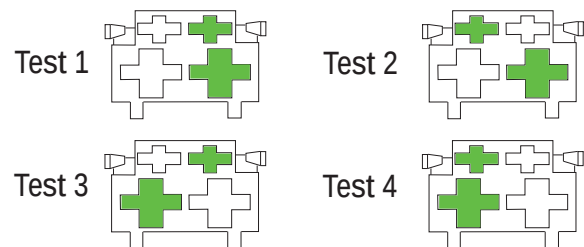
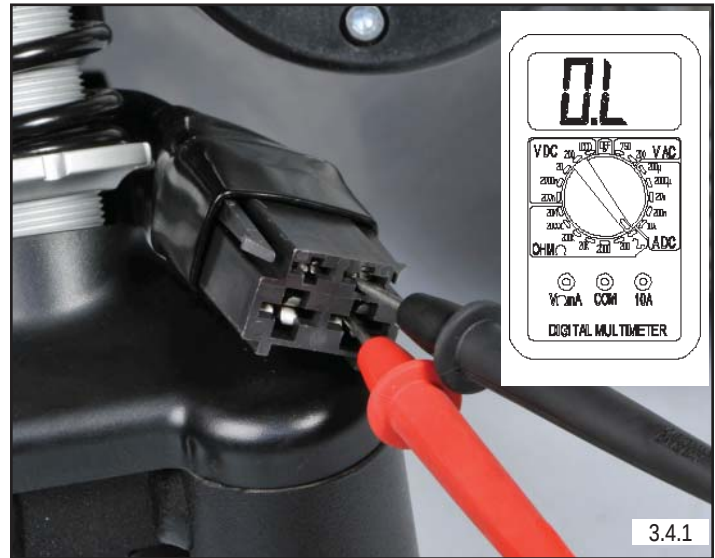
Section 3

VR2 Controller Diagnostics Codes (cont.)

Five Bars - Right Motor Wiring Trip

Check that the batteries are fully charged and in good condition; and check all cables and connections. Check the connections to the right motor, look for a loose or damaged connector.

If the reading is short (resistance is less than 10 K ohms) on any of the readings, proceed to check the 4-pin motor connector. Measure the resistance from the bottom contact of the red thick wire on the 4-pin right motor connector to each of the top contacts of the connectors see (figure 3.4.1). Measure the resistance from the bottom contact of the black thick wire on the 4-pin right motor connector to each the top contacts of the connector (below right). If all of the readings are open, then replace the controller. If any of the readings are short, then replace the right motor.



Six Bars - Charger Connected

The Onboard Batteries are being charged with the off-board charger. You will not be able to drive the wheelchair until the charger is disconnected. You will have to reset the control system by switching off the power and the Powering up again. The On-Board charger has no indication that the chair is charging, and the chair will not move until complete.

If the condition still exists after the charger has been disconnected and the chair has been switched off and powered up again, the Joystick module may be defective.

Seven Bars - Possible Joystick Trip

A joystick trip is indicated. Make sure that the joystick is in the center position before switching on the control system.

Check that the batteries are fully charged and in good condition, examine the joystick for damage. This fault can be caused by a joystick that fails to center itself due to being dirty, bent or broken. If this is the case, replace the joystick module.

Note: If replacing the joystick does not resolve the issue, replace the cable connecting the joystick to the controller.

Seven Bars + Speed Profile Indicator Communication Error

Inspect wiring between joystick module and controller. Replace the jumper or joystick module with damaged wiring. If the problem persists replace the controller.

Section 3

VR2 Controller Diagnostics Codes (cont.)

Eight Bars - Possible Control System Trip

Controller Fault - A control system trip is indicated. Make sure that all connections are secure. Check that the batteries are fully charged and in good condition, and check all joystick connections and cables. If this does not correct the problem, disconnect the power to the controller for 2 minutes, replug in to reboot the module. If the condition still exists, then replace the controller.

Nine Bars - Solenoid Brake Trip

The parking brakes have a bad connection. Check the parking break and motor connections. Make sure the control system connections are secure. Measure the two small contacts on the four-pin motor connector (fig 3.5.1). If both motor connectors read approximately 60 ohms, then replace the controller. Otherwise replace the motor that does not read approximately 60 ohms.



Ten Bars - High Battery Voltage

An excessive voltage has been applied to the control system. This is usually caused by a poor battery connection. Check the battery connections.

Battery Fault

Check that the batteries are fully charged, the correct voltage and in good condition. Take a voltage reading from pin 1 and pin 2 of the charger port of the VR2 controller, see (figure 3.5.2) If the meter reads more than 30 volts, then check the charger. Otherwise, replace your controller.



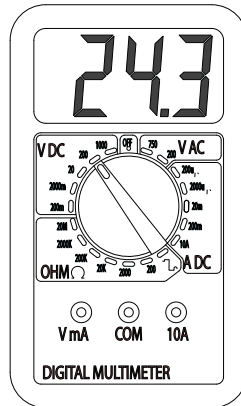


Section 4

R-net Troubleshooting Procedures

Chair Will Not Power Up

1. Check for battery voltage at the hand control using a Multimeter. Connect the Multimeter between the two outside pins (fig 4.1.1), pin 1 is positive (+), pin 2 is negative (-). Note: Positive is on the right.

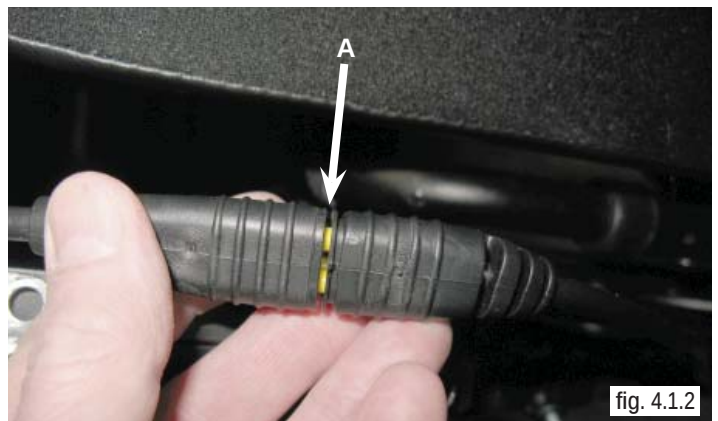


2. If battery voltage is present, replace the following components in this order:

- a. Cables
- b. Hand control
- c. Control module. Refer to Control Module Replacement section of this manual.
- d. Retest as necessary.

3. Verify that the bus cables are correctly mated between the hand control and the control module (fig 4.2).

Note: This connector is mated incorrectly. The connectors are designed to visually indicate when they are not mated correctly. If yellow is showing between the halves (A), push them closer together until only black is visible. Retest as necessary.



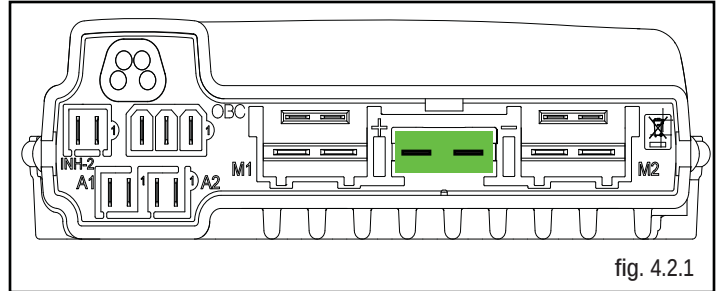
Section 4

R-net Troubleshooting Procedures

4. Disconnect the joystick harness (bus cable) from the controller. Use a Multimeter to test voltage at the positive (+ red) and negative (- black) ports in the controller module (fig. 4.2.1). If voltage is present, replace the following components in this order:

- a. Harness
- b. Joystick

If voltage is NOT present please proceed to step 5.



5. Disconnect the power connector from the control module, and use a Multimeter to check for battery voltage at the connector (fig4.2.2). If voltage is present, replace the control module. Retest as necessary.

Note: The power connector is the larger 2-pin connector between the left and right motor cable.



6. Manually tilt the seat back and remove the shroud from the base. Refer to Battery Removal section of this manual.

7. Disconnect the batteries (fig 4.2.3).



Section 4

R-net Troubleshooting Procedures

9. Verify that battery voltage is present at each connector leading to the batteries (fig. 4.3.1). (Each battery should be approximately 12 volts.)



10. If battery voltage is not present, use a Multimeter and measure for continuity across the fusible links connected to positive (+) terminal of each battery (fig. 4.3.2). Normal resistance is less than 1 ohm. If open, replace the defective battery harness. Retest as necessary.





Section 5

R-net Fault Codes

Power Chair Displays a Fault on the Hand Control or Omni

The R-Net control used on this power chair is constantly monitoring for conditions that can cause unsafe or erratic operation. When a fault is displayed, refer to the fault code table in this manual for a list of corrective actions.

The following identifies which module of the control system has registered the problem.

- PM-Power Module (Control Module)
- JSM-Joystick Module/Omni Module
- ISM-Intelligent Seating/lighting Module

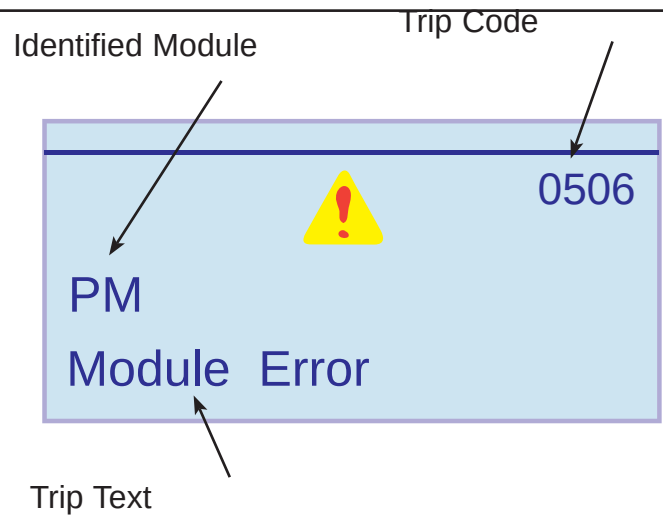
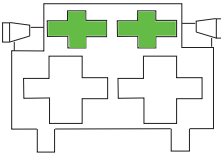
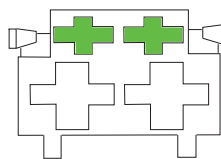


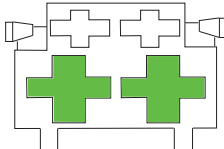
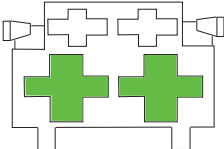
Table 1, Error Codes

Trip Text	Corrective Action
Joystick Error	Ensure that the joystick is centered upon power up. If it is centered, replace the hand control.
Low Battery	Recharge the batteries. After charging, perform the Battery Testing section of this manual.
High Battery	Verify that the battery charger is not defective. Leave the chair on for a few minutes to drain off the excess charge. Check the condition of the battery charger.
M1 Brake Error	Verify that the left motor is connected to the module. Check brake resistance at the motor connector. Brake resistance should be approximately 16 ohms.  
M2 Brake Error	Verify that the right motor is connected to the control module. Brake resistance should be approximately 16 ohms. Brake resistance should be approximately 16 ohms.  

Section 5

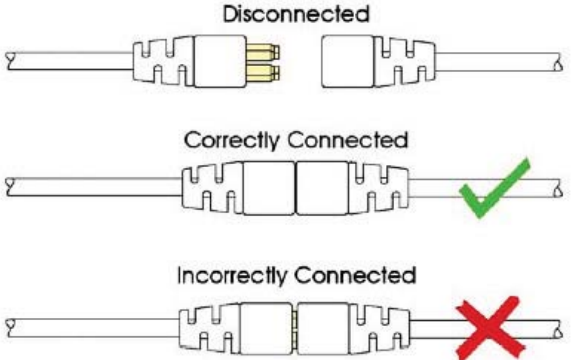
R-net Fault Codes cont.

Table 1, Error Codes cont.

M1 Motor Error	Verify that the left motor is connected to the control module. Check Motor resistance at the motor connector. Normal resistance will be between 0-1.5 ohms.  
M2 Motor Error	Verify that the right motor is connected to the control module. Check Motor resistance at the motor connector. Normal resistance will be between 0-1.5 ohms.  
Inhibit Active	Cycle power. Check all cable connections. If this does not correct the fault, contact Sunrise Technical Service for assistance.
Joystick Cal Error	Calibrate the joystick. If the error is still present, the hand control may be defective.
Latched Timeout	A latch function has exceeded its preset time.
Over-current	This fault occurs when the limits of an actuator circuit are exceeded. Perform Tilt Will Not Operate troubleshooting section of this manual to test the end of travel limit switches.
Overtemp. (Acts)	This error indicates that the Intelligent Seating Module (ISM) has become excessively warm. Note: An ISM is only required when there are more than 2 actuators and may not be mounted on this power chair. Allow the unit to cool. If the error repeats, the actuator may be defective or over loaded.
Overtemp. (Lamps)	Note: This fault can only occur if an Intelligent Seating Module is used on this power chair and connected to external lights.
DIME Error	This error indicates that one or more of the modules are not compatible. Remove the last module installed and retest. Recycle the power. Contact Sunrise Technical Service for assistance.
Memory Error	Recycle the power. Verify that the cables are correctly mated. If a module has been replaced recently, suspect that module may be defective. Contact Sunrise Technical Service for assistance.
PM Memory Error	Recycle the power. Verify that the cables are correctly mated. If a module has been replaced recently, suspect that module may be defective. Contact Sunrise Technical Service for assistance.

Section 5

R-net Fault Codes cont.

Bad Cable	Inspect and replace the defective cable(s).
Bad Settings	Verify that the programming agrees with the installed equipment. If all settings are correct, the control module may be defective. Contact Sunrise Technical Service for assistance.
Module Error	Recycle the power. Verify that the cables are correctly mated. If a module has been replaced recently, suspect that module may be defective. Contact Sunrise Technical Service for assistance.
System Error	Recycle the power. Verify that the cables are correctly mated. If a module has been replaced recently, suspect that module may be defective. Contact Sunrise Technical Service for assistance. 
SID Detached	The Omni has detected that a specialty control has become disconnected. Recheck all cables. If the error is still present, replace the specialty control.
User Switch Detached	Indicates that a user switch has become disconnected. Reconnect the switch.
Gone to Sleep	The predetermined sleep time has been exceeded due to inactivity by the user.
Charging	This indication is present when the battery charger is connected. There may also be an error in the control module. Contact Sunrise Technical Service for assistance.

Example of R-10 Fault Isolation

1. In this example, one of the right motor being disconnected (fig.5.3.1). The hand control displays the fault and the power chair will not operate.
2. To troubleshoot this problem, refer to Table 1, Error Codes.
3. From this error we see that the problem is being recorded in the PM (Control Module).
4. The hand control tells us that motor 2 (M2) has the error and it is with the brake circuit. Motor 2 is the right motor.
5. Table 1 informs us to, "Verify that the right motor is connected to the control module. Complete the Motor and Gearbox Inspection section of this manual."
6. The next step is to complete the Motor and Gearbox Inspection section of this manual and



Section 5

Troubleshooting Tilt

Does the chair have powered seating? If so, the slow driving may be a result of an active inhibit from the seating system. Start by identifying what seating components are on the chair. An inhibit can come from either the power recline or power tilt system. Bring your tilt and recline to the upright position. If the wheelchair is still in creep try to identify which component may be causing the inhibit

1. Locate the 6-pin connector (A) at the rear of the tilt (fig. 5.4.1). Make sure it has not been unplugged

2. Locate the creep microswitch (B) mounted at the rear of the actuator (fig. 5.4.1). The creep switch may be seen from the top of the seating system on the right rear of the actuator. It may be necessary to remove the seat pan to access the switch.

3. Manually operate the creep micro-switch while observing the hand control or Omni for the turtle symbol to go on and go off with the micro-switch operation.

If the symbol changes, the problem is in the programming. Contact Sunrise Medical Technical

Service for assistance.

4. Lower the tilt system.

5. Locate the 6-pin connector (A) at the rear of the tilt (fig. 5.4.1).

6. Disconnect the harness from the control module.

8. Test the micro-switch wiring by performing the following test.

a. Ensure that the seat is in the full down position.

b. Use Multimeter and measure continuity between the indicated pins below on the 6-pin connector mounted on the tilt. When down the indication should be closed (fig. 5.4.2). If it is open, replace the micro-switch assembly. Refer to Tilt Actuator and Micro-Switch Removal section of this manual.

If the test passes, replace in this order:

- Cable leading from tilt to control module.
- Control module

Tilt with Recline: Refer to the recline section of this manual

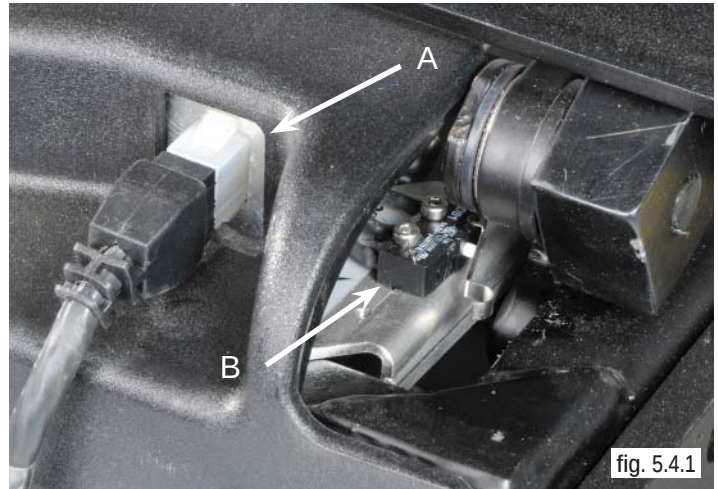


fig. 5.4.1

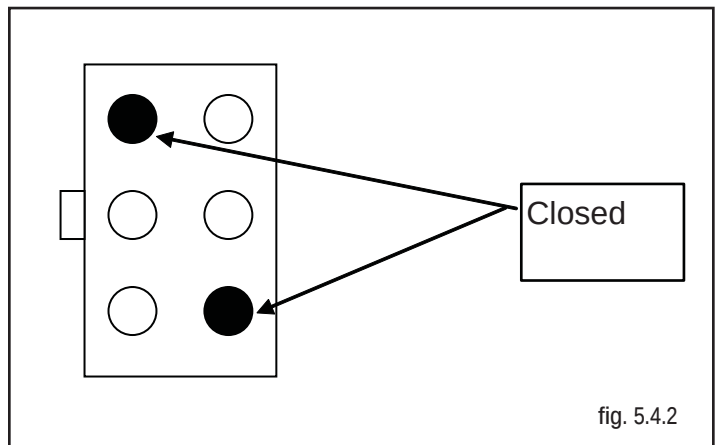


fig. 5.4.2

Section 5

Troubleshooting Tilt cont.

Power Chair Will Not Drive in Creep Speed when Tilted

An external micro-switch is mounted next to the actuator in the rear of the tilt system. This micro-switch is closed when the tilt is lowered. The closing of this micro-switch allows a signal to be being sent to the control module through the 6-pin connector located on the back of the tilt. The signal informs the control module that the tilt is less than 16 degrees and that maximum speed should be used. If the tilt is more than 16 degrees, the switches opens and invokes "Creep" Speed. Creep speed is a predetermined speed programmed at time of manufacture. Creep is indicated by a "turtle" on either the color Joystick or Omni.

1. Tilt the seat all the way back and observe the hand control or Omni to see if the turtle symbol is displayed.

If the turtle (A) is displayed (fig 5.5.1), contact Sunrise Medical Technical Service for assistance.

If no turtle is displayed, continue to step 2.

2. Tilt the seating system beyond 16 degrees.

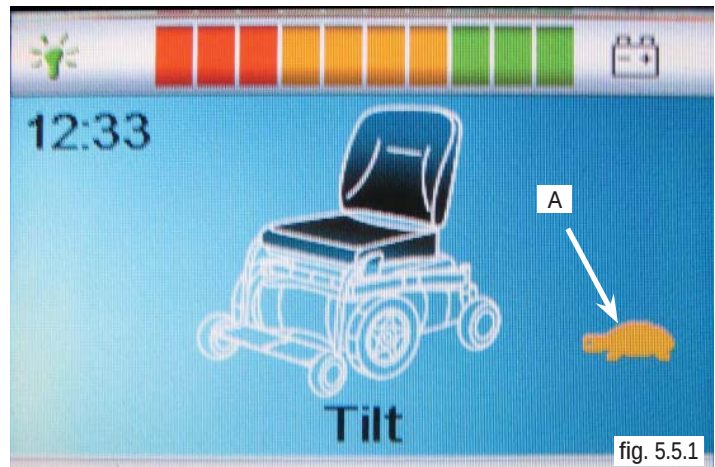


fig. 5.5.1

3. Locate the 6-pin connector on the rear of the tilt. (fig 5.5.2). Disconnect the harness from the tilt module.

4. Test the micro-switch by performing the following test:

a. Ensure that the tilt is beyond 16 degrees.

b. Use the multimeter and measure continuity between the indicated pins on the pin connector mounted on the tilt. When the seat is tilted the indication should be open (fig 5.5.3).



fig. 5.5.2

If it is closed, replace the micro-switch.

Refer to tilt actuator and micro-switch removal section of this manual.

Re-test as necessary.

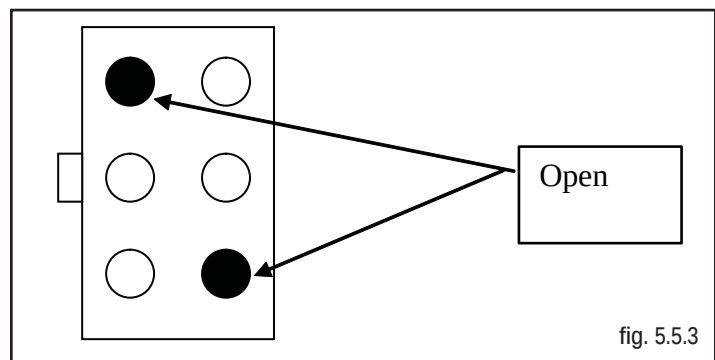


fig. 5.5.3

Section 5

R-net Fault Codes cont.

Tilt Will Not Operate

The tilt actuator used in the tilt system receives power through a 6-pin connector located at the rear of the tilt. The actuator also contains micro-switches that open at the end of their stroke to prevent stressing of the tilt system. Around these micro switches are diodes that allow reverse power to flow to the actuator when reversing direction.

1. Selected the tilt mode on the Joystick or Omni. (fig. 5.6.1). Operate the joystick and listen closely to the control module for a click. This click indicates that the control module is closing the power relay inside and supplying power to the tilt actuator.

If no click is heard, replace the control module or ISM

If click is heard proceed to step 2.

2. Verify that tilt is selected on the hand control. Operate the joystick and listen closely to the tilt actuator. If the actuator appears to be running but the tilt is not moving, replace the tilt actuator.

3. If the actuator does not appear to be running, locate the 6-pin connector on the rear of the tilt actuator (fig. 5.6.2) and disconnect it.

4. Select tilt on the hand control and place a rubber band around the joystick to hold it displaced (fig. 5.6.3).



Section 5

R-net Fault Codes cont.

Tilt Will Not Operate - cont.



Warning: Use caution in the next step. Do not short the leads of the Multimeter together or damage may occur to the control module.

5. At the 6-pin connector on the cable leading to the control module, verify that battery voltage is present between the indicated pins (fig. 5.7.1). Note: The polarity of the voltage is not important since it reverses when the opposite direction is selected.

6. If voltage is not present, replace the cable leading to the control module. Retest with new cable. If the new cable does not correct the problem, replace the control module.



fig. 5.7.1

7. At the 6 pin connector (fig. 5.7.2) on the rear of the tilt, check to see if the actuator is capable of tilting if power is applied directly to the actuator (fig 5.7.3). Or, proceed to step 8.



fig. 5.7.2

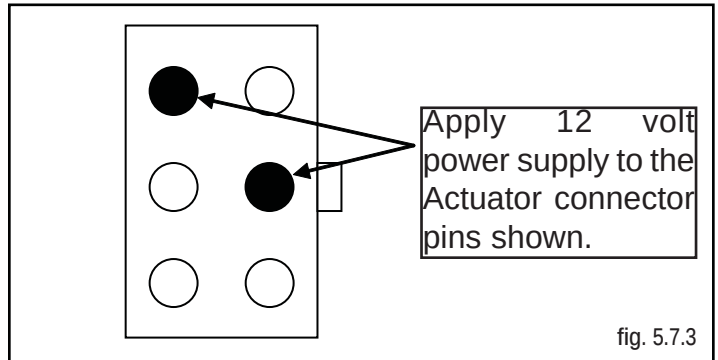


fig. 5.7.3

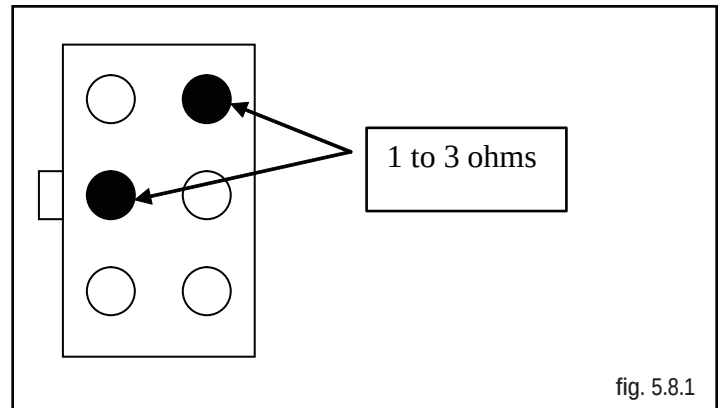
Section 5

Tilt Will Not Operate - cont.

Note: Since the tilt actuator will not operate, it is only possible to check for one condition. Pick the condition below that best describes the position of the tilt system.

8. Tilt is in mid-stroke. (Fig 5.8.1)

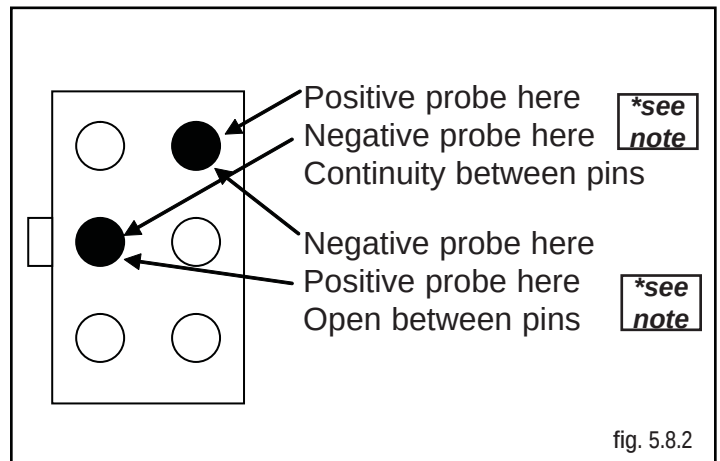
The value recorded is the resistance through the actuator motor windings. If this reading is not correct, replace the tilt actuator and retest.



10. Tilt is in the full down position. (Fig 5.8.2)

If the readings are not correct, replace the tilt actuator.

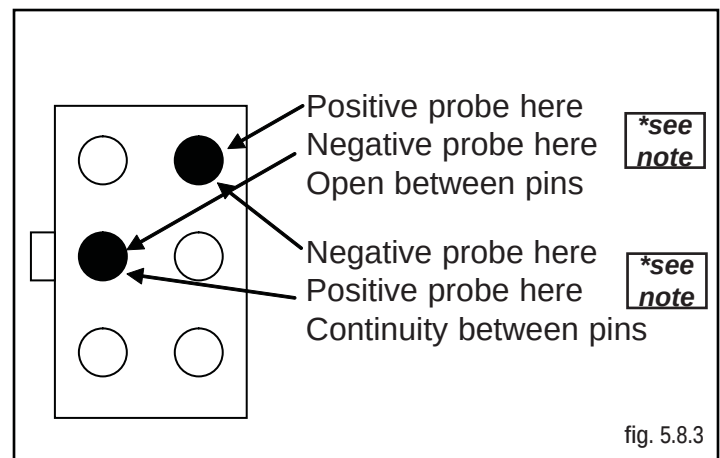
Note: The value recorded in one direction is the forward resistance through a diode and will vary with the type of Multimeter used. This value is not important, as long as there is continuity in one direction only. This value may even be high. The value recorded in the other direction is across the open contact of the end of stroke micro-switch and should be open.



11. Tilt is in the full up position. (Fig 5.8.3)

If the readings are not correct, replace the tilt actuator.

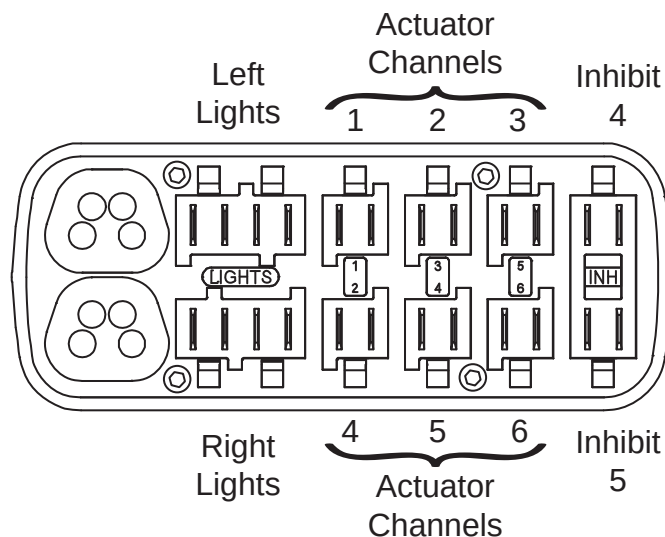
Note: The value recorded in one direction is the forward resistance through a diode and will vary with the type of Multimeter used. This value is not important, as long as there is continuity in one direction only. This value may even be high. The value recorded in the other direction is across the open contact of the end of stroke micro-switch and should be open.



Section 6

Troubleshooting Recline

Power Recline is offered on the Rhythm. This Powered seating option Offers both Power Recline and Power Shear and its operation is controlled by the ISM (Intelligent Seating Module).



Power Chair Will Not Drive at Full Speed

The Power Recline System has 3 Possible Minimum angles 90, 95, 100 degrees. This angle is set by programming. The minimum angle for each chair is based on how the chair was ordered. The ISM (Intelligent Seating Module) calculates the degree based on the resistance of the recline actuator's internal potentiometer. To determine what angle your back should be calibrated to you can contact Sunrise Customer Service to see confirm what angle was requested when the chair was built. (Making changes to this preset "Home Angle" will require a program change.) You can confirm the recline calibration using the following chart.

Recline Angle (Degrees)	Potentiometer Resistance (K Ohms)	Length of Act Rod (From lower eyelet to eyelet) (In)
Calibration Point (81)	1	19.37
90	1.5	
95	1.8	
100	2.1	
165	6.1	14

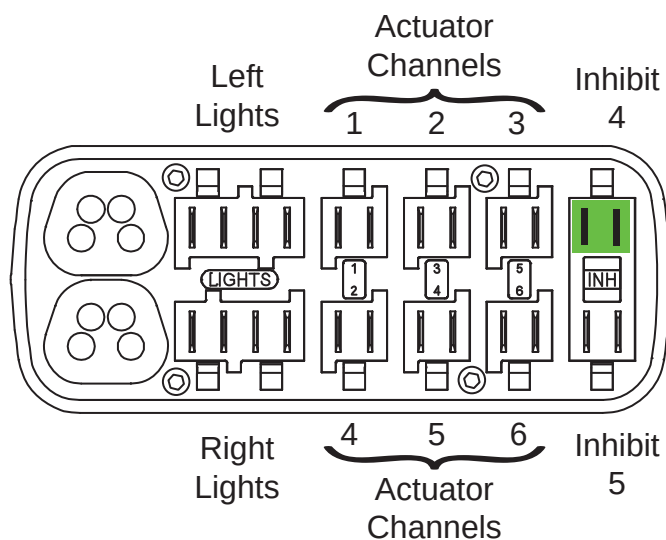
Section 6

Troubleshooting Power Recline Calibration.

1. Start by bringing the backrest into the upright position.
Remove the shroud covering the backrest and locate the ISM. (fig. 6.2.1)
2. The recline Inhibit connector is the 2 pin connector located at Inhibit 4 port in the ISM. (fig. 6.2)



fig. 6.2.1



3. Check the recline potentiometer resistance at the Inhibit 4 harness as shown. (fig 6.2.2)

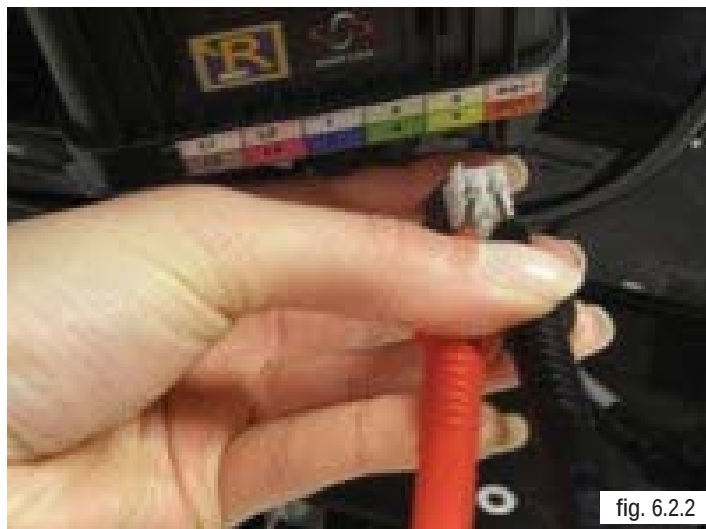


fig. 6.2.2

Section 6

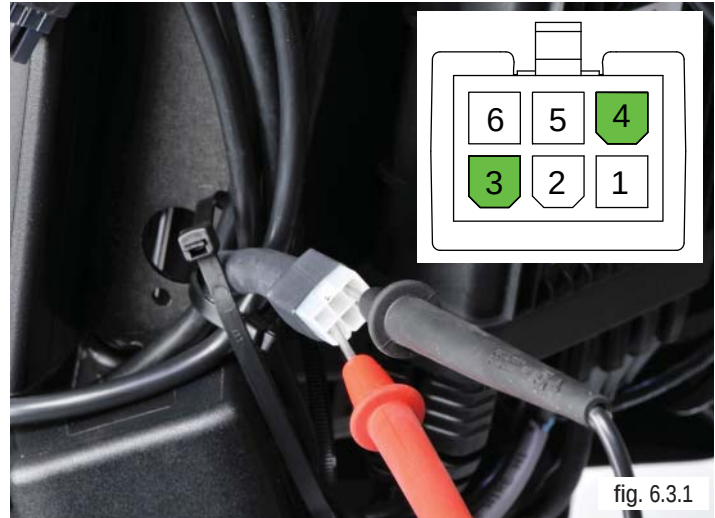
4. If you have a correct reading at this location, skip to step 6.

If your reading is open, take a reading directly from the 6-pin recline actuator harness (fig 6.3.1) at pins 3 & 4.

5. If your reading is still open, replace the recline actuator and re-rest.

If your reading matches the Recline Calibration Chart above, then replace the harness from the recline actuator to the ISM.

6. If you do have a reading, but find that it does not match the calibration chart based on your preset angle, remove the recline actuator (follow installation instructions from this manual). Once removed, run direct power to the actuator until you are able to match the desired resistance 1.0 k ohms when monitoring pins 3 & 4 with your multi meter. Once this reading is achieved, you will be able to rotate the actuator rod to match the length listed on the calibration chart. (fig 6.3.2)



Power Chair will not Drive in Creep Speed when Reclined

If the wheelchair is not driving in creep speed when the backrest is reclined more than 110 degrees, refer to the above the recline actuator calibration process. And re-test.

If the calibration process does not correct the issue, please contact Sunrise Medical Tech Support.

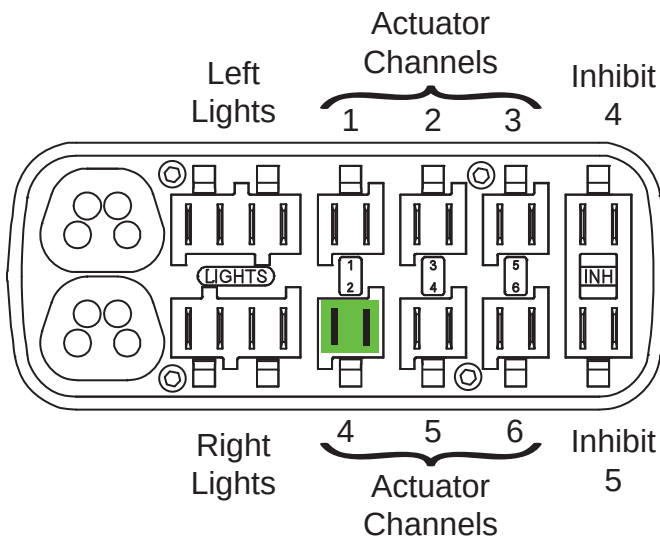
Section 6

Power Recline does not Operate

1. Verify that the recline has not been disabled in programming. If it has been disabled, enable the option and re-test.
2. If actuator resistance is lost, the actuator will no longer be displayed as an option on the joystick. To test the recline actuator resistance, locate the ISM mounted on the back of the wheelchair. (fig 6.4.1)
3. Disconnect the 2-pin connector at actuator port 5 (Fig 6.3.)



fig. 6.4.1



4. Check for resistance at this harness, normal resistance would be 2 to 4 ohms. If you have verified resistance at this connection, Replace the ISM.

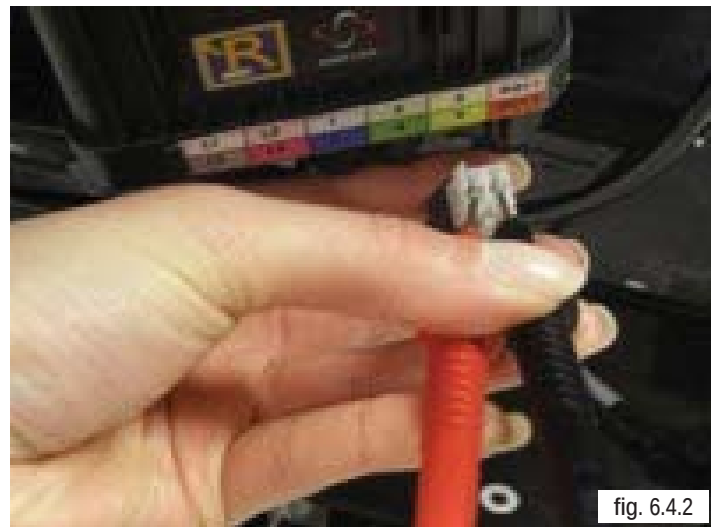


fig. 6.4.2

5. If your reading is open, re-test the resistance at the 6 pin connection leading directly from the recline actuator (fig 6.4.2) at pins 1 and 5. (Fig 6.4.3)

If your reading is open, replace the recline actuator.

If resistance is verified, replace the harness leading from the 6 pin actuator harness to the ISM.

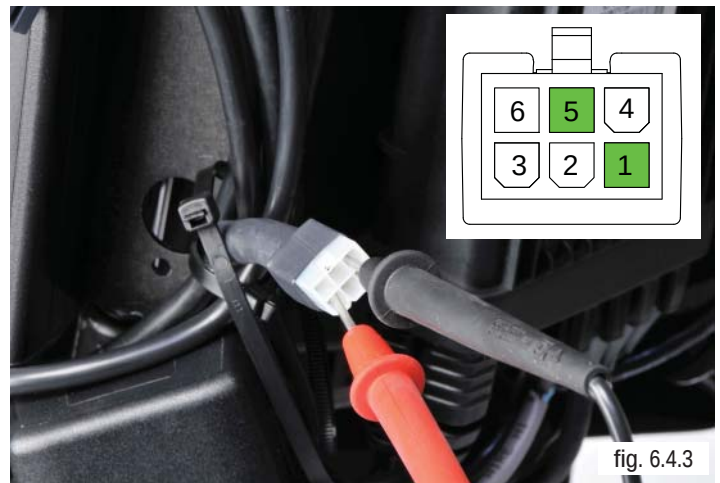


fig. 6.4.3

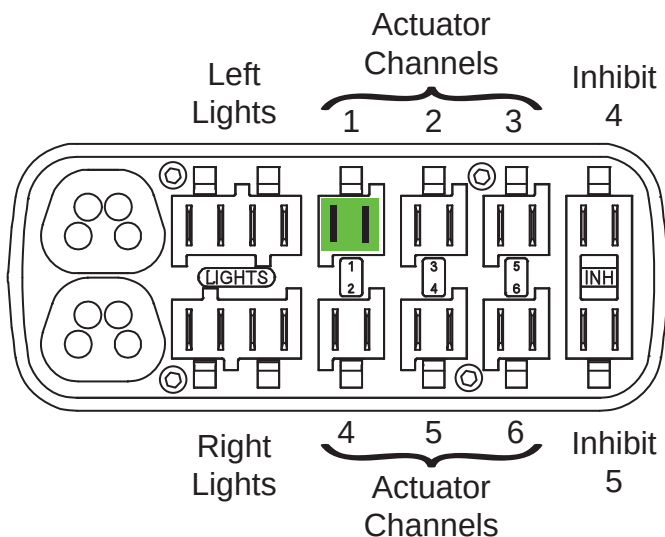
Section 6

Power Shear Does not Operate

1. To test the Shear actuator resistance, locate the ISM mounted on the back of the wheelchair.
2. Disconnect the 2 pin connector at actuator port 1 (fig. 6.5.1)
3. Check for resistance at this harness, normal resistance would be 6 to 8 ohms when the actuator is in mid-stroke and greater than 1 m ohms when at either extremity.
If you have verified resistance at this connection, Replace the ISM.



fig. 6.5.1



4. If your reading is open, re-test the resistance at the 6 pin connection leading directly from the shear actuator (fig 6.5.2) at pins 1 and 5.
If your reading is open, replace the shear actuator.
If resistance is verified, replace the harness leading from the 6 pin actuator harness to the ISM.

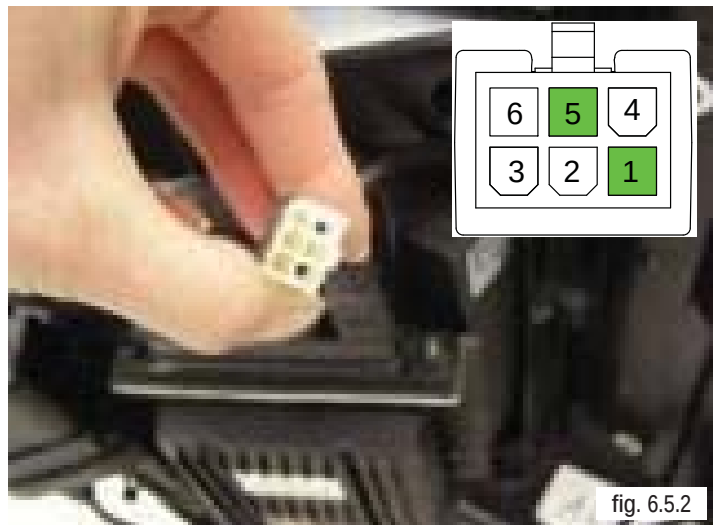


fig. 6.5.2



Section 7

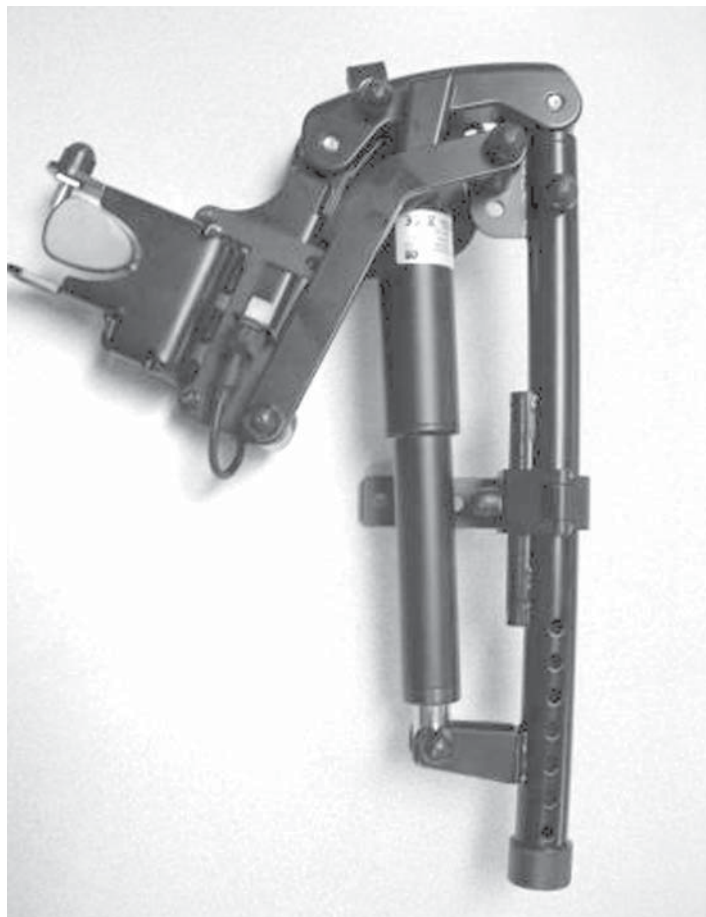
Troubleshooting Power Legrest

We are offering two versions of power legrest, Center Mount legrest actuator and Swing away Dual Elevating / Articulating (ELR/ALR). With these new assemblies, the actuator is attached directly to the legrest.

Power Center Mount Legrest



Power ELR/ALR Swing-Away Legrest

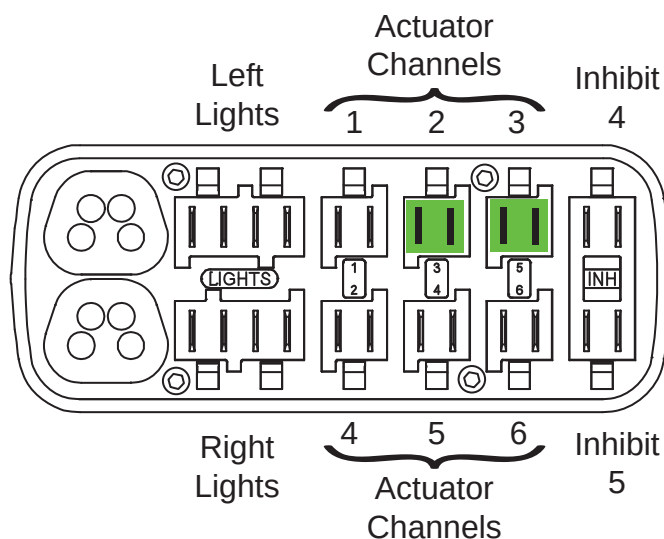


Section 7

Troubleshooting Power Legrest - cont.

1. Are you able to access the legrest option on the joystick menu? If yes, contact Sunrise Medical Tech support for assistance.
2. If No, Verify that the legrest option is enabled in programming and check all connections from the legrest actuators to the ISM.
3. If all connections are good, disconnect the legrest harness from the ISM.

	Power Center mount	Dual Legrests
Act Port 2	Extend	Right Leg
Act Port 3	Elevate	Left Leg



4. Check resistance at this 2 pin connection. (fig 7.2.1)
 5. If no resistance If found, check resistance at the 6-pin connection directly from the actuator at pins 1 and 5. (fig 7.2.2)
- If no resistance is found, replace the legrest actuator that is not functioning.
- If resistance is verified at this actuator connector, replace the harness from the actuator to the ISM.

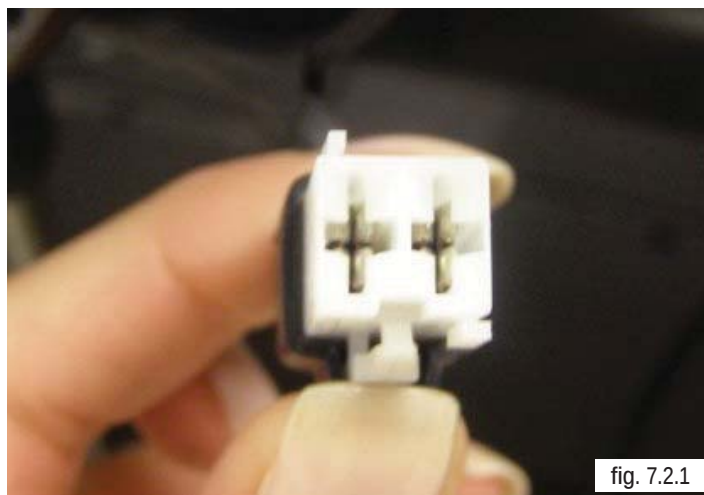


fig. 7.2.1

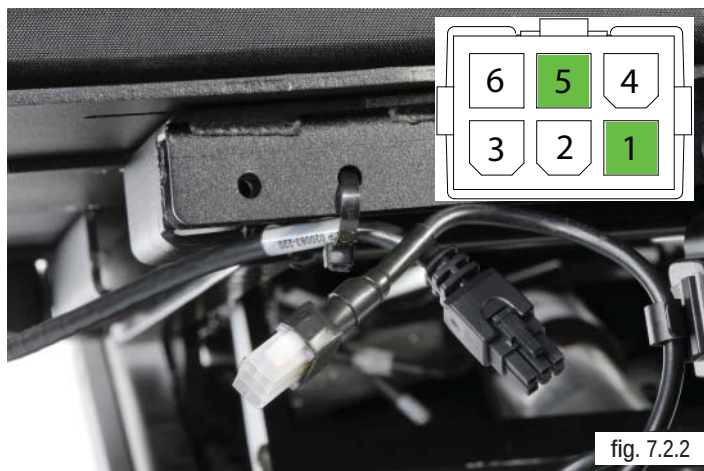
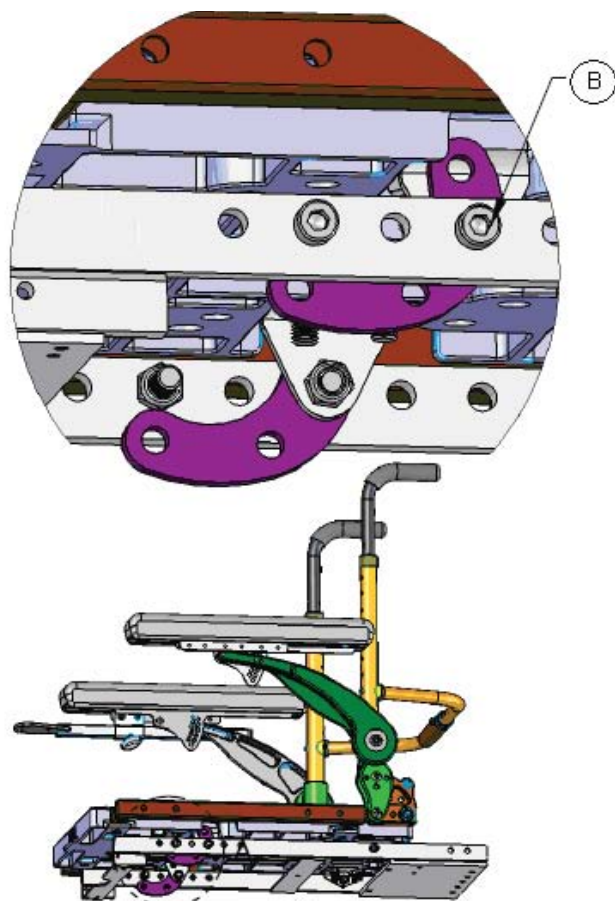


fig. 7.2.2

Section 8

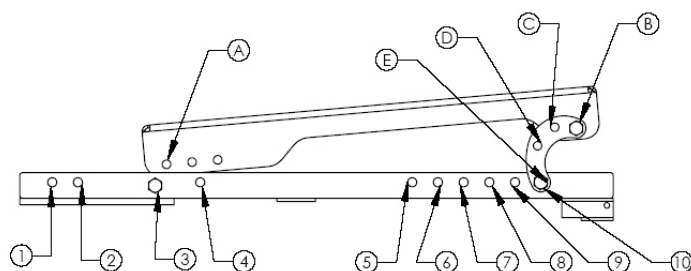
Seating System Mounting Instructions

Non Tilt Module/Packer Interface



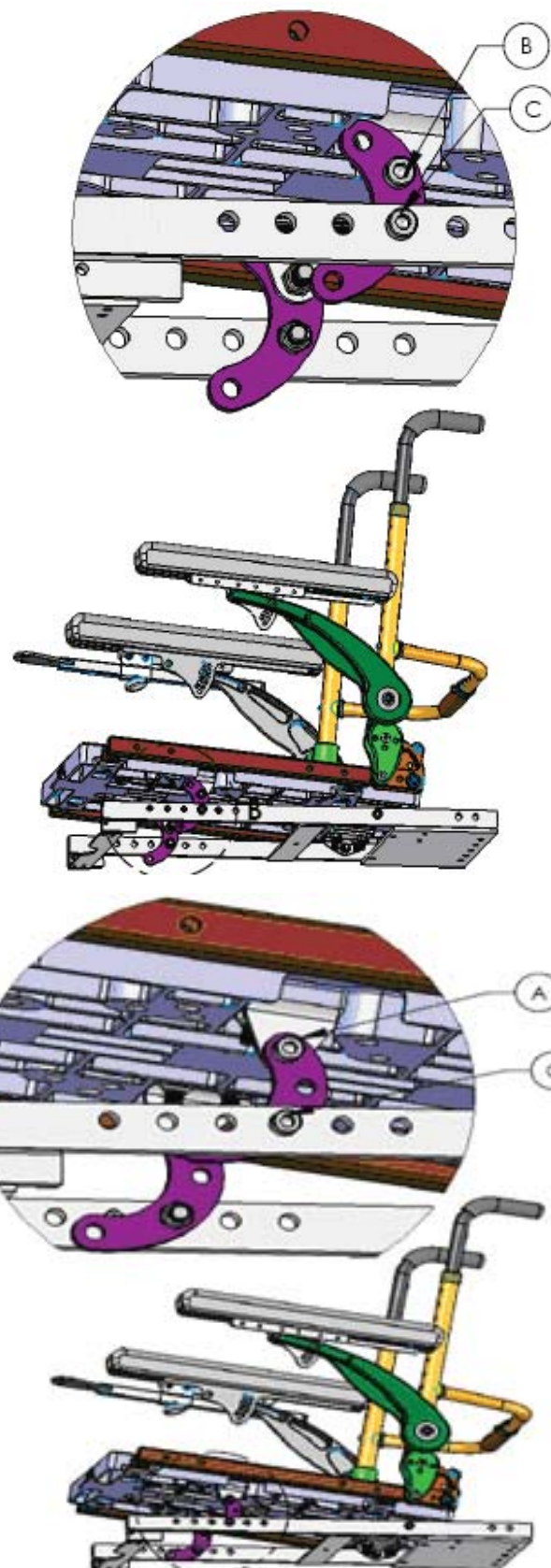
For 0° pretilt use Hole 3&6 on interface with hole B on curved Bracket

Extra bolt and nut use hole 8



	Rehab Seat 15-24W Rehab Seat 12-14W	Rehab Seat 15-24W 22" Depth Power Recline	ASAP
Packer	A to 2: B,C,D or E to 8	A to 1: B,C,D or E to 7	N/A

For 0° pretilt use Hole B
For 3° pretilt use Hole C
For 6° pretilt use Hole D
For 9° pretilt use Hole E

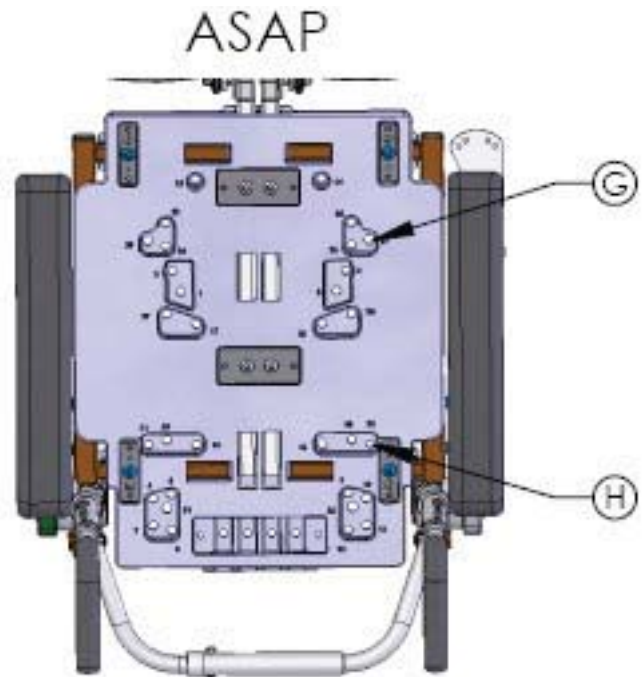
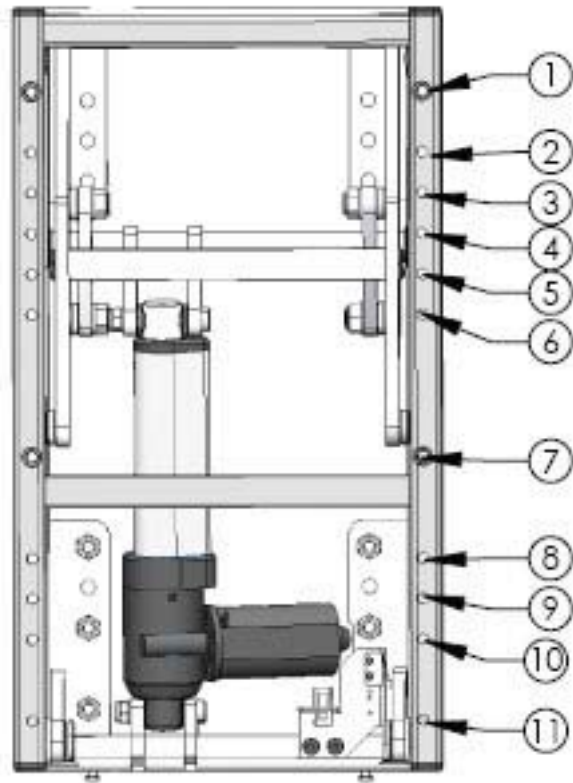


For 9° pretilt use Hole 3&6 on interface with hole A&C on curved bracket

Section 8

ASAP (Tilt Only) Seating System Mounting Instructions

Seat to Tilt Mounting



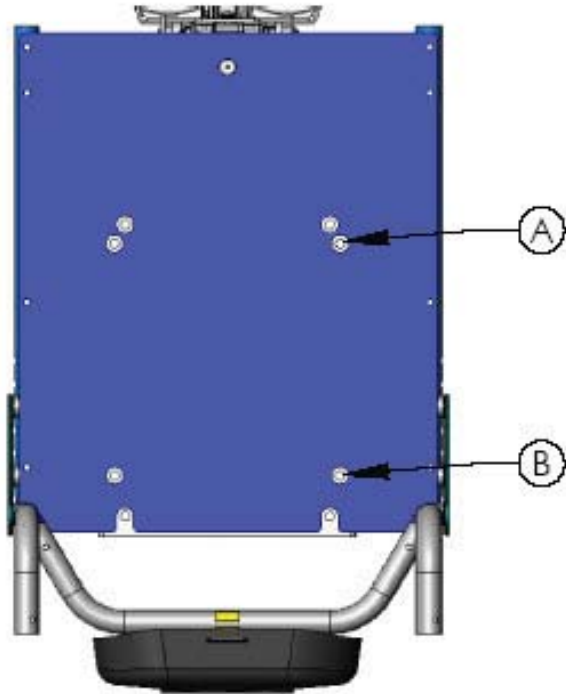
ASAP
G&H to 1&7

Section 8

Traditional Rehab Seating System Mounting Instructions

Seat to Tilt Mounting

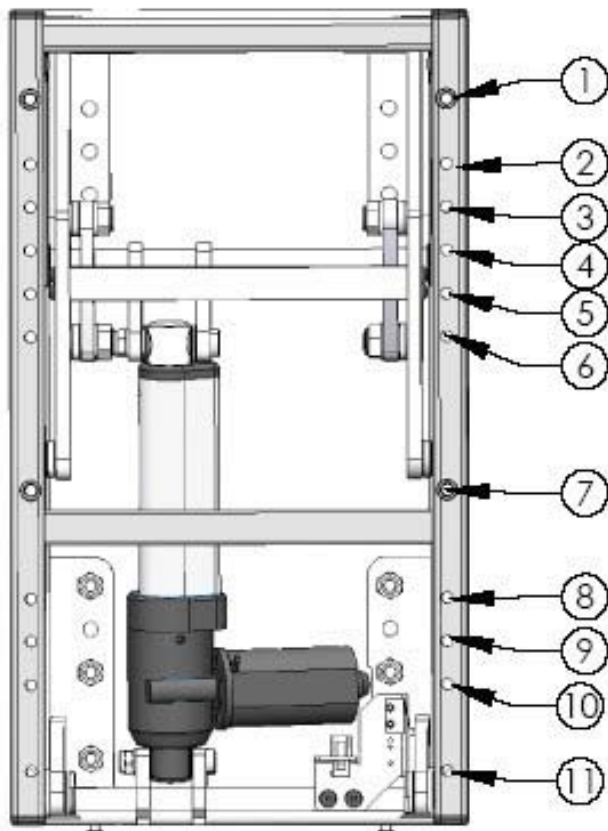
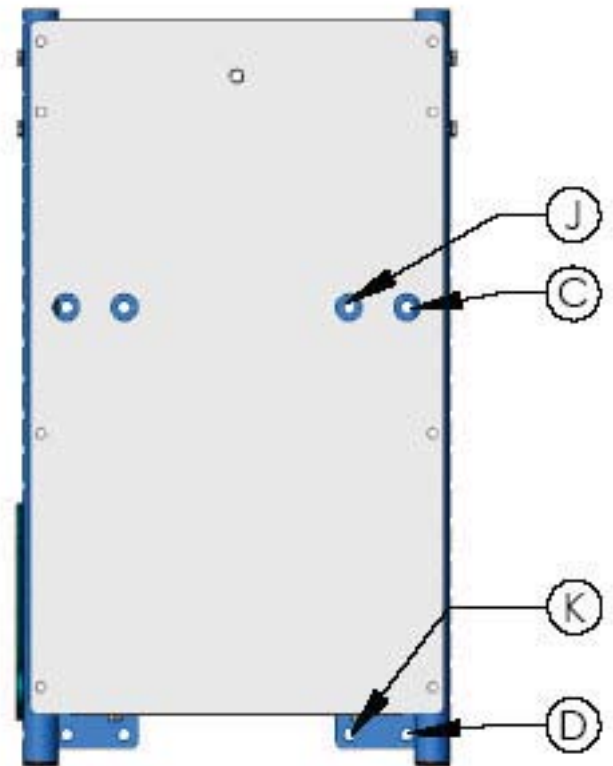
15-24" Wide Rehab



Rehab Seat 15-24W
All Depths
A&B to 3&9

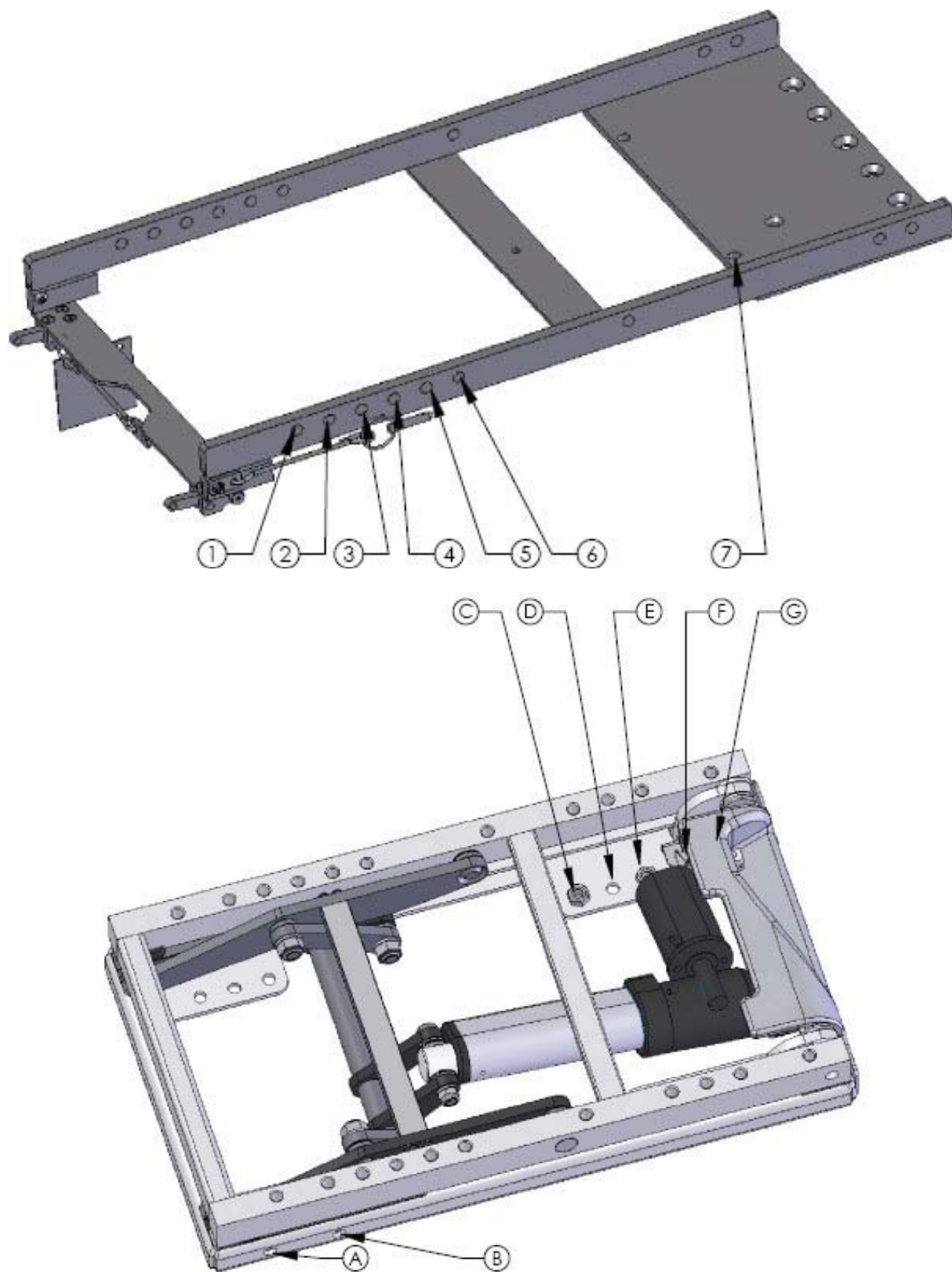
Rehab Seat 12-14W
C&D to 4&11

12-14" Wide Rehab



Section 8

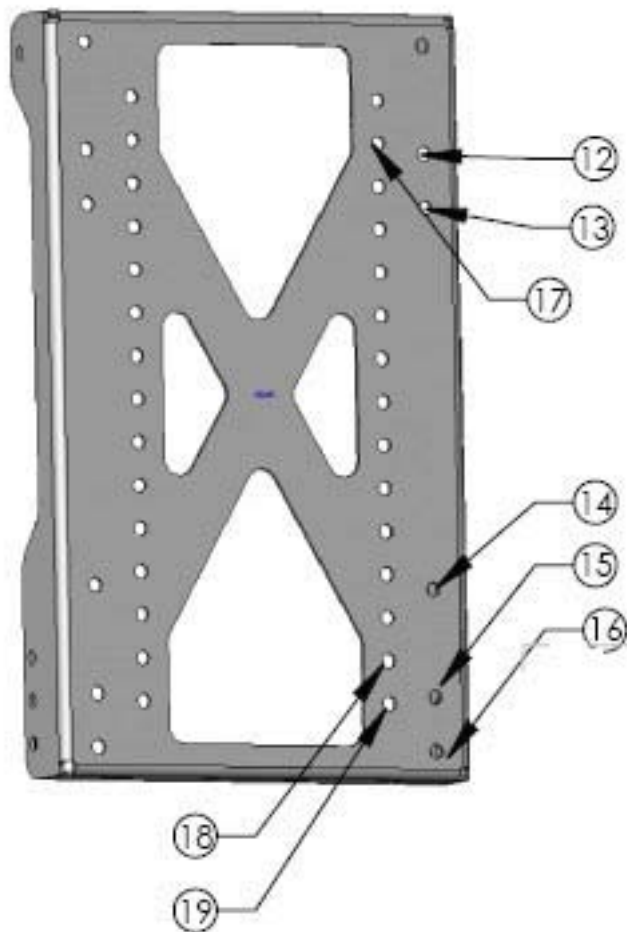
Tilt to Interface Mounting



Section 8

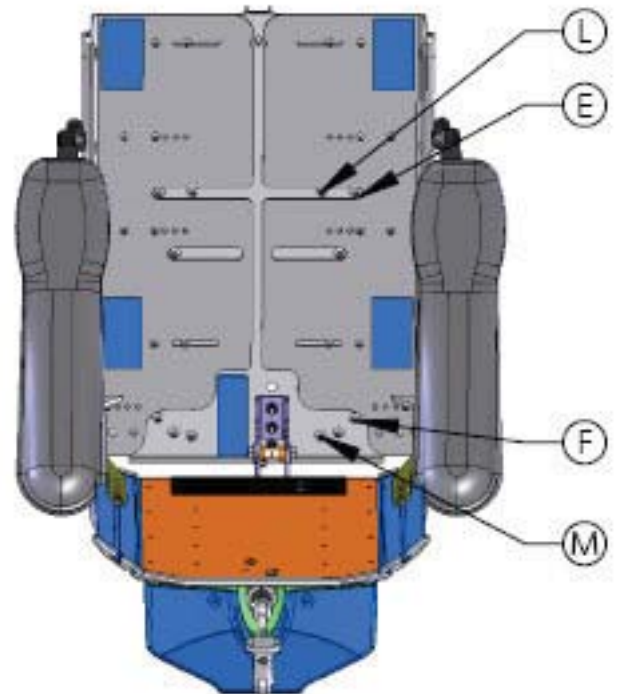
New Power Recline Seating System Mounting Instructions

Seat to Recline Mounting



	Power Recline
Packer	L&M to 17&19

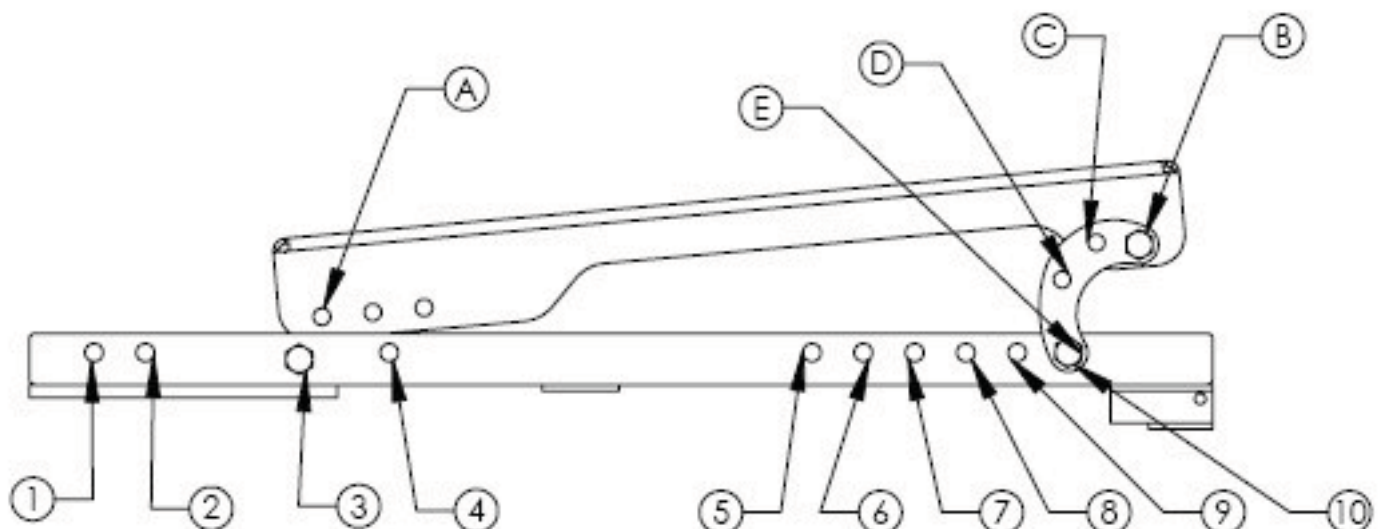
Power Recline



Power Recline

A to 1: B, C, D or E to 7

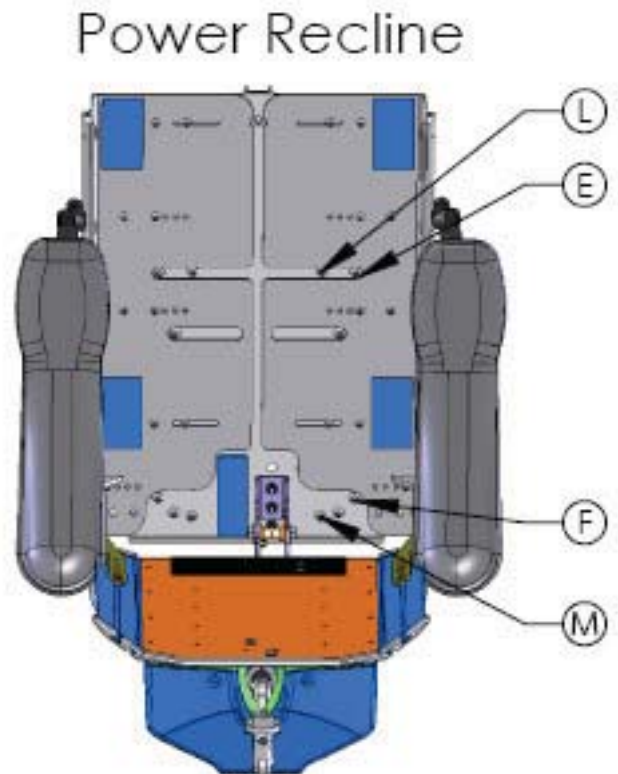
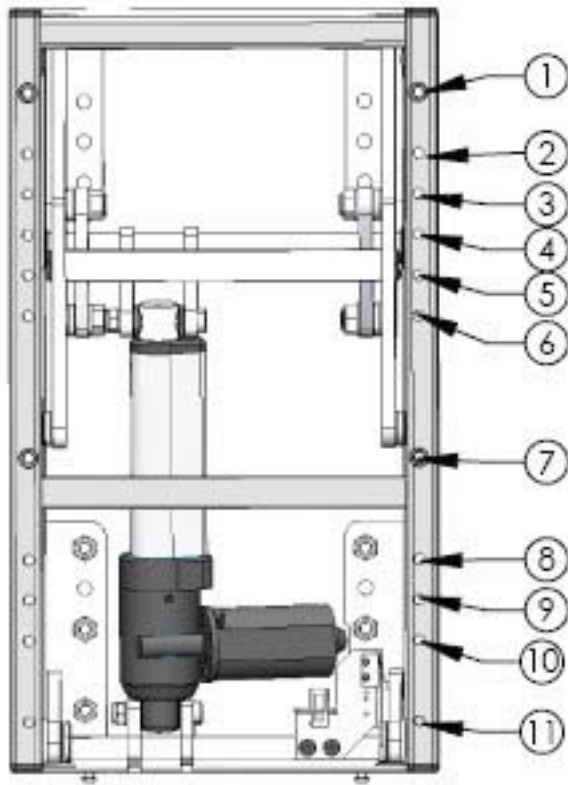
For 0° pretilt use Hole B
 For 3° pretilt use Hole C
 For 6° pretilt use Hole D
 For 9° pretilt use Hole E



Section 8

New Power Tilt & Recline Seating System Mounting Instructions

Seat to Tilt/Recline Mounting:

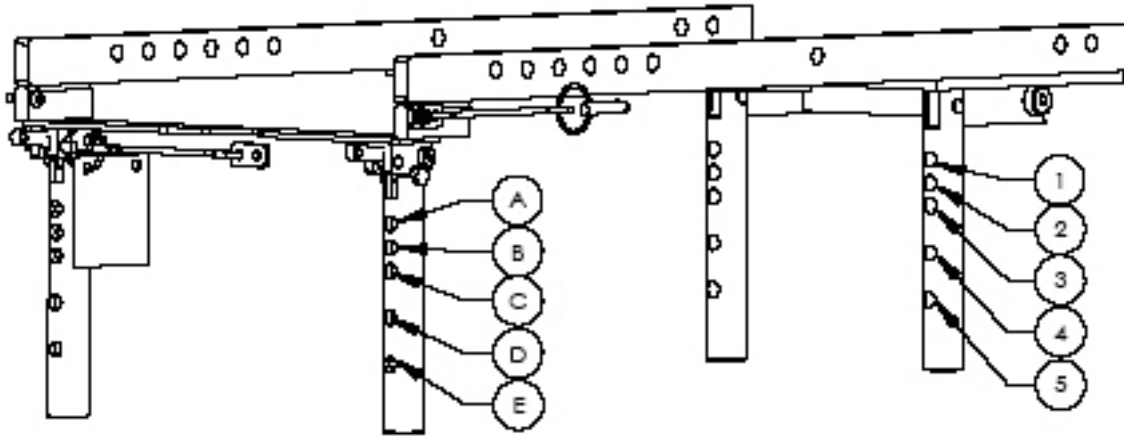


	Power Recline
Tilt	E&F to 2&10

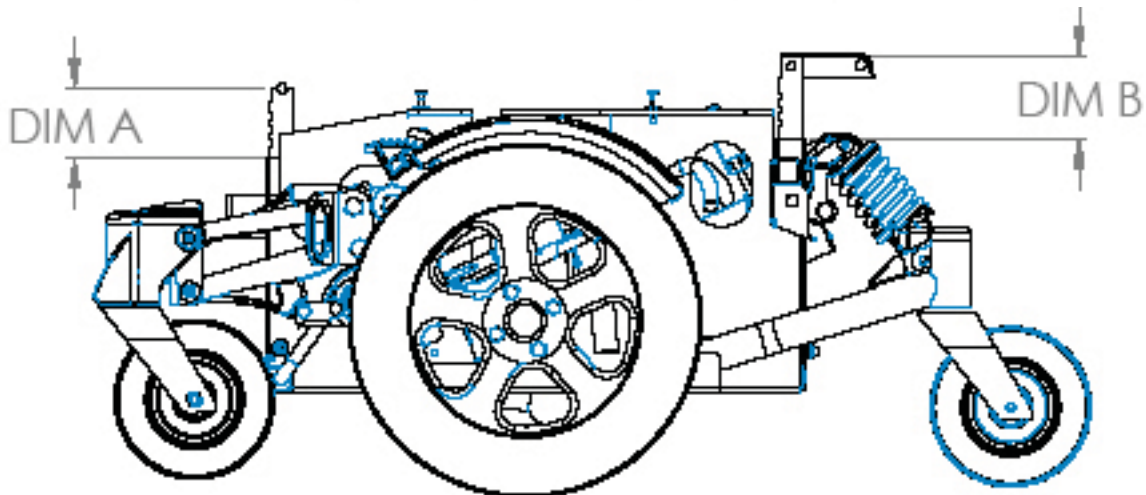
fig. 7.7

Section 8

Seat to Floor Height Matrix



REAR SEAT POST POSITION	FRONT SEAT POST POSITION		
		DIM A	DIM B
1	A	0.6	1.1
1	C	1.6	
2	B	1.1	1.6
3	C	1.6	
3	D	2.6	2.1
4	D	2.6	
4	E	3.6	3.1
5	E	3.6	
		3.6	4.1



Actual STFH dimensions are listed for short configuration:
Add 1" for Med / Add 2" for Tall / add 3" for Extra Tall

fig. 7.11

Section 8

Seat to Floor Height Matrix (cont)

	Actual STFH (in)	Post Position Short	Post Position Med	Post Position Tall	Post Position Extra Tall	Pre-Tilt Angle (degrees)
Power Recline						
No Module	17.1	1 / A	3 / C	4 / D	5 / E	0
No Module with Transit	17.6	2 / B	3 / C	4 / D	5 / E	
Tilt	17.9	1 / A	3 / C	4 / D	5 / E	
Tilt with Transit	18.4	2 / B	3 / C	4 / D	No Go	
No Module	18.2	1 / A	3 / C	4 / D	5 / E	3
No Module with Transit	18.7	2 / B	3 / C	4 / D	No Go	
Tilt	19.0	1 / C	3 / D	4 / E	No Go	
Tilt with Transit	19.6	2 / C	4 / E	5 / E	No Go	
No Module	19.3	1 / A	3 / C	No Go	No Go	6
No Module with Transit	19.8	2 / B	3 / C	No Go	No Go	
No Module	20.4	1 / A	No Go	No Go	No Go	9
No Module with Transit	20.9	2 / B	No Go	No Go	No Go	
Asap Seating						
No Module	17.1	1 / A	3 / C	4 / D	5 / E	0
No Module with Transit	17.6	2 / B	3 / C	4 / D	5 / E	
Tilt	18.6	1 / A	3 / C	4 / D	5 / E	
Tilt with Transit	19.1	2 / B	3 / C	4 / D	5 / E	
No Module	18.2	1 / A	3 / C	4 / D	5 / E	3
No Module with Transit	18.7	2 / B	3 / C	4 / D	No Go	
Tilt	19.7	1 / C	3 / D	4 / E	No Go	
Tilt with Transit	19.5	2 / C	3 / D	4 / E	No Go	
No Module	19.3	1 / A	3 / C	No Go	No Go	6
No Module with Transit	19.8	2 / B	3 / C	No Go	No Go	
No Module	20.4	1 / A	No Go	No Go	No Go	9
No Module with Transit	20.9	2 / B	No Go	No Go	No Go	

Section 8

Seat to Floor Height Matrix (cont)

Traditional Rehab Seating 15-24" Width

No Module	16.8	1 / A	3 / C	4 / D	5 / E	0
No Module with Transit	17.3	2 / B	3 / C	4 / D	5 / E	
Tilt	17.5	1 / A	3 / C	4 / D	5 / E	
Tilt with Transit	18.0	2 / B	3 / C	4 / D	No Go	
No Module	17.9	1 / A	3 / C	4 / D	5 / E	3
No Module with Transit	18.4	2 / B	3 / C	4 / D	No Go	
Tilt	18.6	1 / C	3 / D	4 / E	No Go	
Tilt with Transit	19.2	2 / C	3 / D	4 / E	No Go	
No Module	19.0	1 / A	3 / C	No Go	No Go	6
No Module with Transit	19.5	2 / B	3 / C	No Go	No Go	
No Module	20.1	1 / A	No Go	No Go	No Go	9
No Module with Transit	20.6	2 / B	No Go	No Go	No Go	

Traditional Rehab Seating 12-14" Width

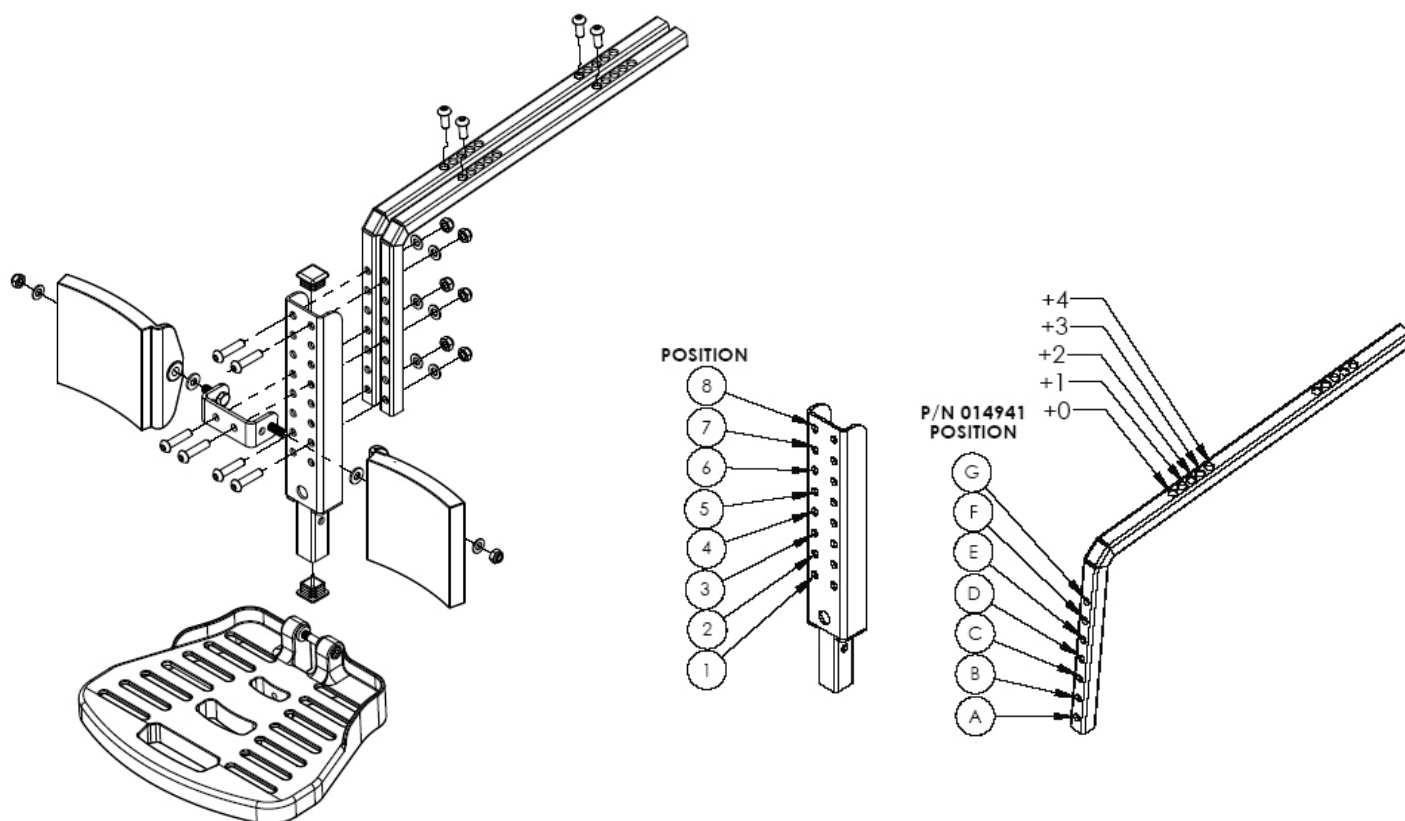
No Module	16.8	1 / A	3 / C	4 / D	5 / E	0
No Module with Transit	17.3	2 / B	3 / C	4 / D	5 / E	
Tilt	17.5	1 / A	3 / C	4 / D	5 / E	
Tilt with Transit	18.0	2 / B	3 / C	4 / D	No Go	
No Module	17.9	1 / A	3 / C	4 / D	5 / E	3
No Module with Transit	18.4	2 / B	3 / C	4 / D	No Go	
Tilt	18.6	1 / C	3 / D	4 / E	No Go	
Tilt with Transit	19.2	2 / C	3 / D	4 / E	No Go	
No Module	19.0	1 / A	2 / B	No Go	No Go	6
No Module with Transit	19.5	2 / B	3 / C	No Go	No Go	
No Module	20.1	1 / A	No Go	No Go	No Go	9
No Module with Transit	20.6	2 / B	No Go	No Go	No Go	

Section 8

Asap Fixed Center mount Footrest Mounting Matrix

Part # 014945 Position	Part # 014941 Position	Leg Length	Ground Clearance Tilt				Ground Clearance Non-Tilt			
STF			18 ½"	19 ½"	20 ½"	21 ½"	17 ¼"	18 ¼"	19 ¼"	20 ¼"
1	A	13 ½"	4 5/8"	5 5/8"	6 5/8"	7 5/8"	3 3/8"	4 3/8"	5 3/8"	6 3/8"
2	A	14 ½"	3 5/8"	4 5/8"	5 5/8"	6 5/8"	2 3/8"	3 3/8"	4 3/8"	5 3/8"
3	A	15 ½"	2 5/8"	3 5/8"	4 5/8"	5 5/8"	1 3/8"	2 3/8"	3 3/8"	4 3/8"
4	A	16 ½"	1 5/8"	2 5/8"	3 5/8"	4 5/8"	3/8"	1 3/8"	2 3/8"	3 3/8"
5	A	17 ½"	5/8"	1 5/8"	2 5/8"	3 5/8"	NOGO	3/8"	1 3/8"	2 3/8"

RED SHADED AREAS ARE NO-GO's
 DEFAULT CONFIGURATEION FROM FACTORY



Section 8

Adjusting Power ELR / ALR Legrest Length

To adjust & or remove the footrest length on a Power ALR/ELR loosen the two 4.0 mm allens to undo the footrest extension tube. Fig 8.6



The actuator is secured to the legrest by a bolt at each end. To better access the top bolt you will need to remove the knee pad first. A 13mm open wrench on the nut and a 13mm socket to remove the knee pad bracket. Fig 8.7



Section 8

Removing the legrest actuator from the ELR / ALR cont.

Use a 13 mm open wrench and a 13mm socket to release the top nut. Fig 8.8



Repeat this process for the bottom nut. Fig 8.9



Adjusting Power Recline Backrest

Adjustments of the New Recline for seat pan are similar to the old perfect fit recline.

Refer to that portion of the Rhythm and Groove service manual for those procedures.

1. The seat-back angle is adjusted thru a change in programming. No mechanical procedures are required.

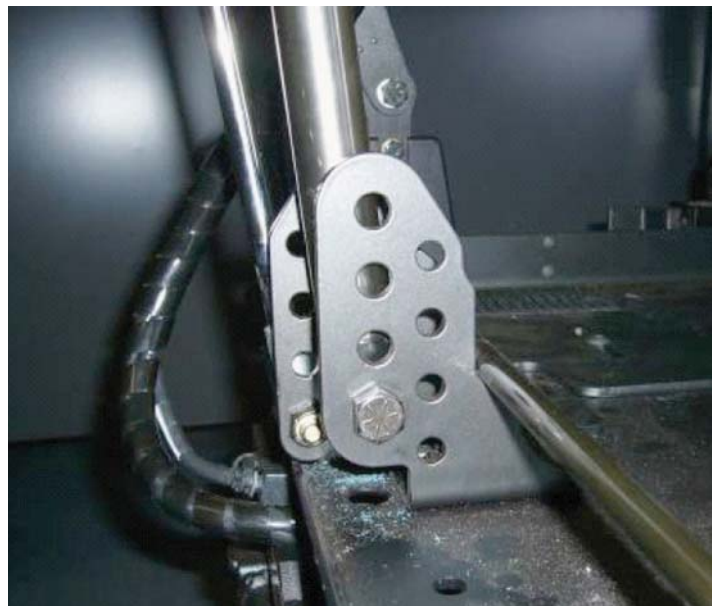
2. The Pivot point may be moved up in the seat-back bracket. The factory setting is 4" measured from the top of the seat pan to the pivot point. This may be adjusted in $\frac{3}{4}$ " intervals. (fig 8.1).

3. Use a $\frac{7}{16}$ " socket and ratchet to remove the pivot point A. Raise it to the desired location (fig 8.2).

4. Reinsert and tighten the bolts securing the pivot point.

5. As the pivot point is raised, the Recline actuator and gas strut **MUST** also be raised an equal amount. This is done by removing the bolts B. (fig 8.3).

Note: If the pivot is raised, it is suggested to replace the back pan with a larger pan to decrease the gap from the bottom of the backrest to the seat pan.



Section 8

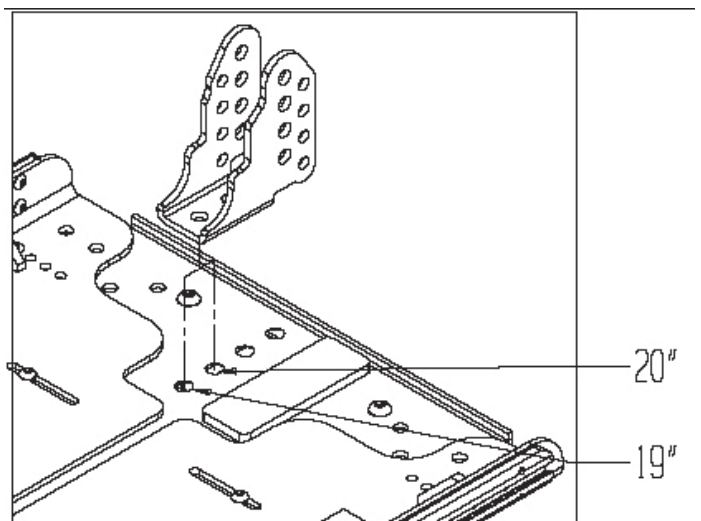
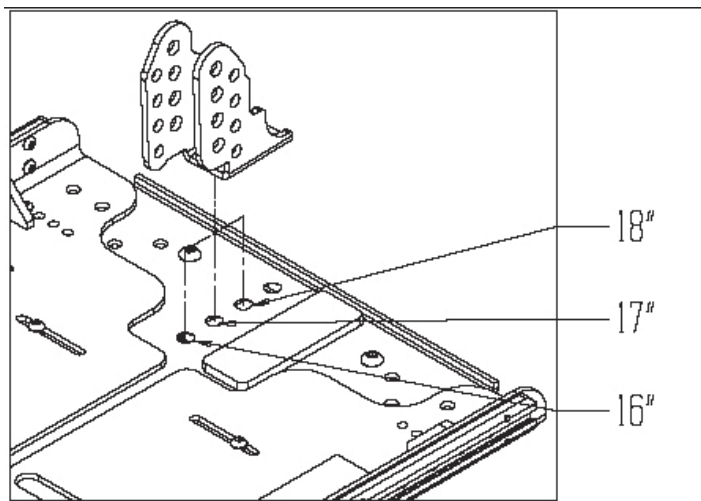
Removal Procedures (cont.)

6. Seat depth is adjusted by moving the mounting brackets to the front or rear in the seat pan track.

7. Loosen the two mounting bolts C and slide the bracket to the desired location. (fig 8.4)



8. It is important to also adjust the placement of the recline actuator pivot bracket when seat depth has been changed. See fig 8.5

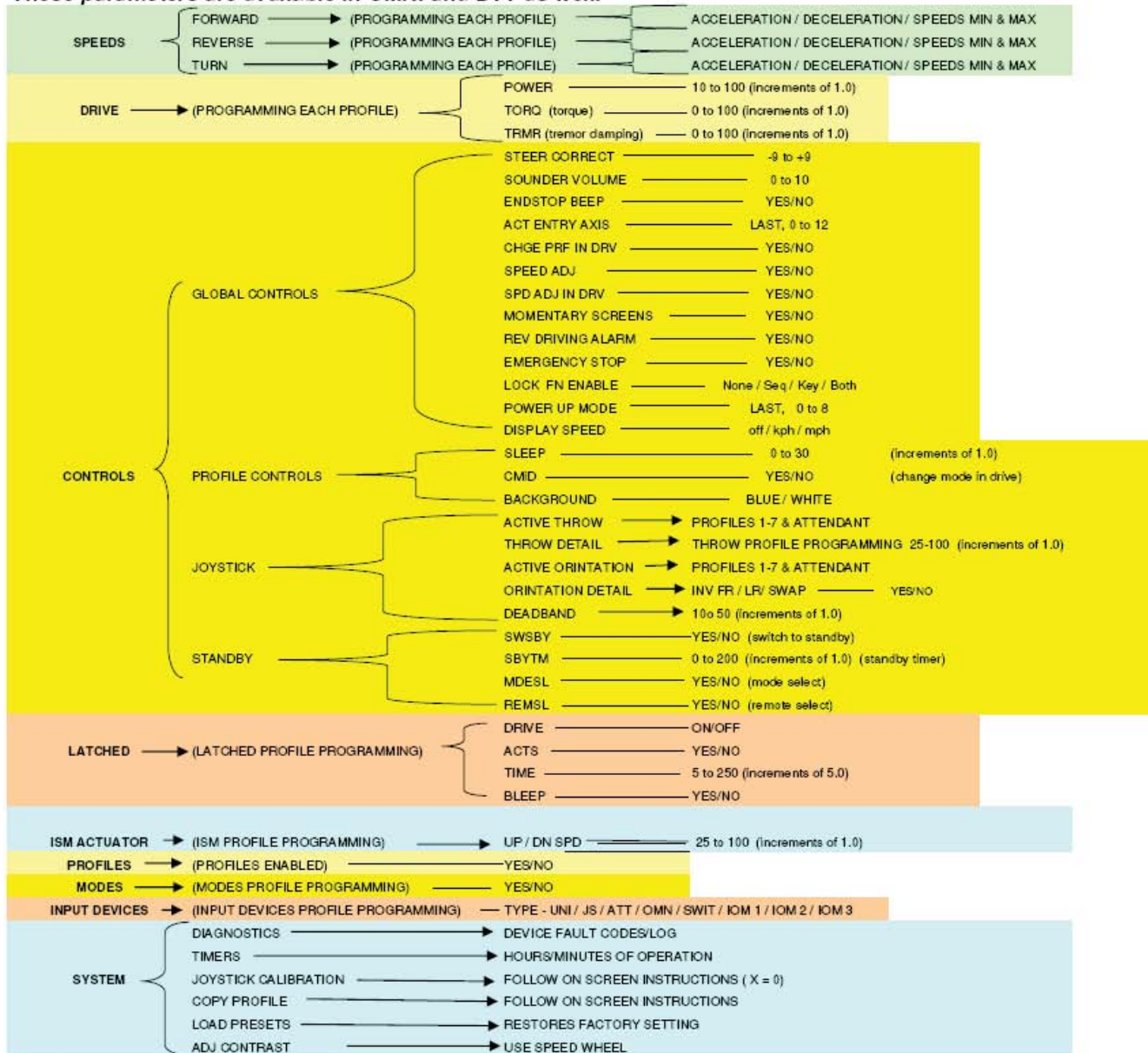


Section 9

OBP Programming Quick Guide

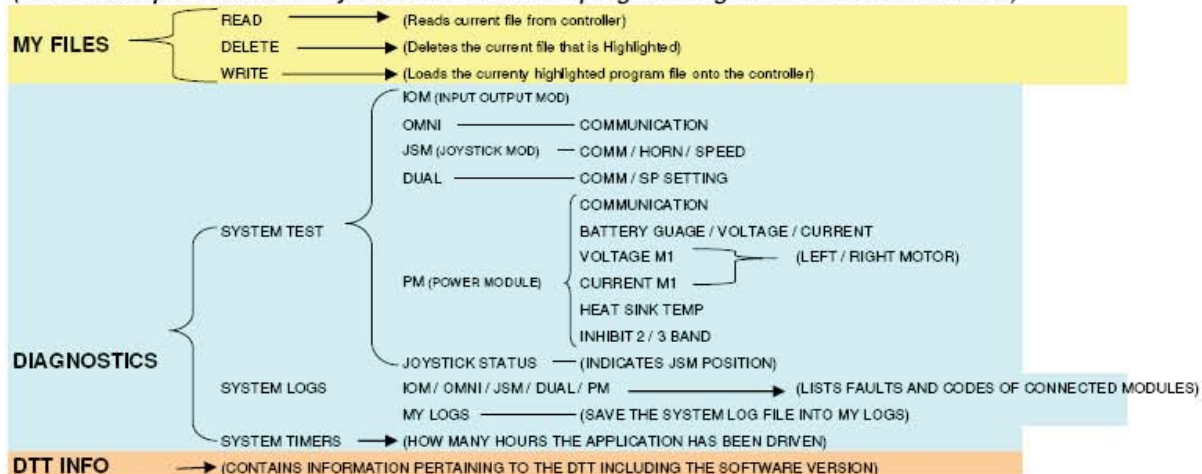
RNET JOYSTICK ON BOARD PROGRAMMING (OBP)

These parameters are available in OMNI and DTT as well.



DIANOSTIC TEST TOOL (DTT)

(Includes all parameters in Joystick OBP and OMNI programming in addition to these below)



Section 9

OBP Programming Quick Guide

OMNI PROGRAMMING (Available when accessing OBP through OMNI or DTT)

(Includes all parameters in Joystick OBP programming in addition to these below)

